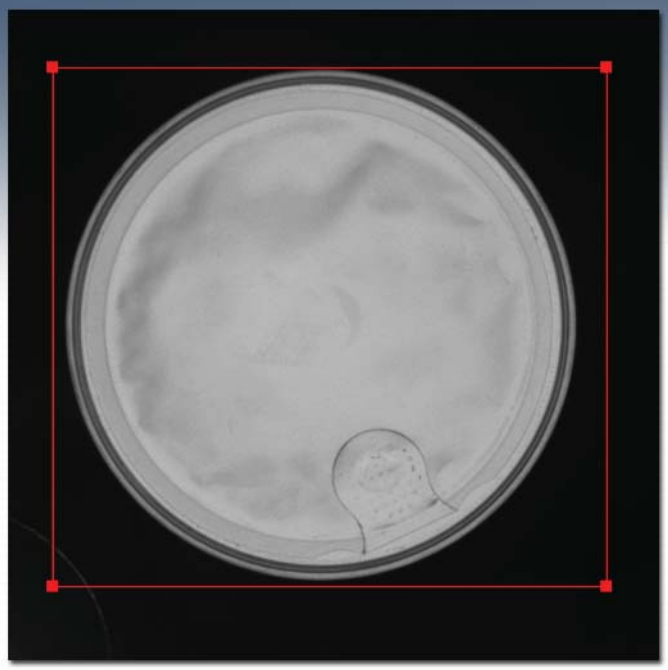
CIVCore 9

Vision Processing Engine



Training and User's Manual

CIVision

LOMAX
Powered by CIVCORE

Foil Membrane Inspection System

This manual is intended to assist a system operator, maintenance and/or administrative personnel, in the operation of a CIVCore based vision inspection system built and supplied by CIVision, LLC.

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CIVCore 9

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Introduction

The purpose of this manual is to serve as a reference for users of any of CIVision's Inspection Systems built around and powered by the CIVCore® Vision Processing engine. This manual describes (in detail) tools and user interfaces built into the CIVCore® engine including:

- CIVCore® Vision Tools
- CIVCore® Product and Tool Setup Screens

Given the large number of tools, processes and functions built into the CIVCore® Vision Engine, not all tools are included in every Inspection System. Some tool interfaces and screens may contain more, fewer or different features then described in this manual. This could be due to added functionality, opt-ing out of certain features, or purchased upgrades.

Getting Started - CIVCore Basics

Main Screen

At start-up, once the system has been powered up and initialized, the Main Screen will appear displaying command buttons in the Control Bar at the bottom of the screen. These buttons are Run/Stop, Faults, Login, Statistics, Parts, Setup, Admin and Quit.

Right: The Main Screen.

The Main Screen is the first screen the user will see after the system has completed it's start-up cycle.

When the system isn't running, the green Run button will be displayed (See lower left of screen shot -*right*). When the system is in Run Mode, the red Stop button will be displayed.

Main Screen Buttons:

The following buttons are available from the Main Screen according to a user's permissions level:

Stop/Run button: Clicking this button will **start or stop** the vision inspection process.

The Run button is only available if the selected part has been "trained" AND the machine is not running. Selecting the Run button will start the inspection process and bring up the Run Screen.

Selecting the Stop button, on any screen, will stop the inspection process and return the user to the Main Screen. The Stop button is only visible when the inspection system is actually running and inspecting parts.

Faults button: Click this button to display the **System Faults window** *(described in detail on page 84 of User's Reference Manual).*

Login button: Click this button to display the Change User Level window. This is where a registered user logs into the system to fully utilize their permissions levels.

Statistics button: Clicking this button will display the **Statistics Screen**. This screen allows the user to modify how the inspection statistics are displayed.

Parts button: Click this button to select a previously saved part to be inspected. The user can also add, delete, and rename existing parts via this screen. .

Setup button: Clicking this button will display the Setup screen. This screen allows the user to modify the accept levels of the currently selected part.

Admin button: With the proper permissions, clicking this button will display the **Administrator Functions** screen. *Operators will be able to utilize this menu solely for that purpose of calibrating the cameras.*

Quit button: Click the "Quit" button to shut down the vision system and/or the computer. This button is only available to those with the proper permissions and only becomes "active" when the system is in "Stop" mode.

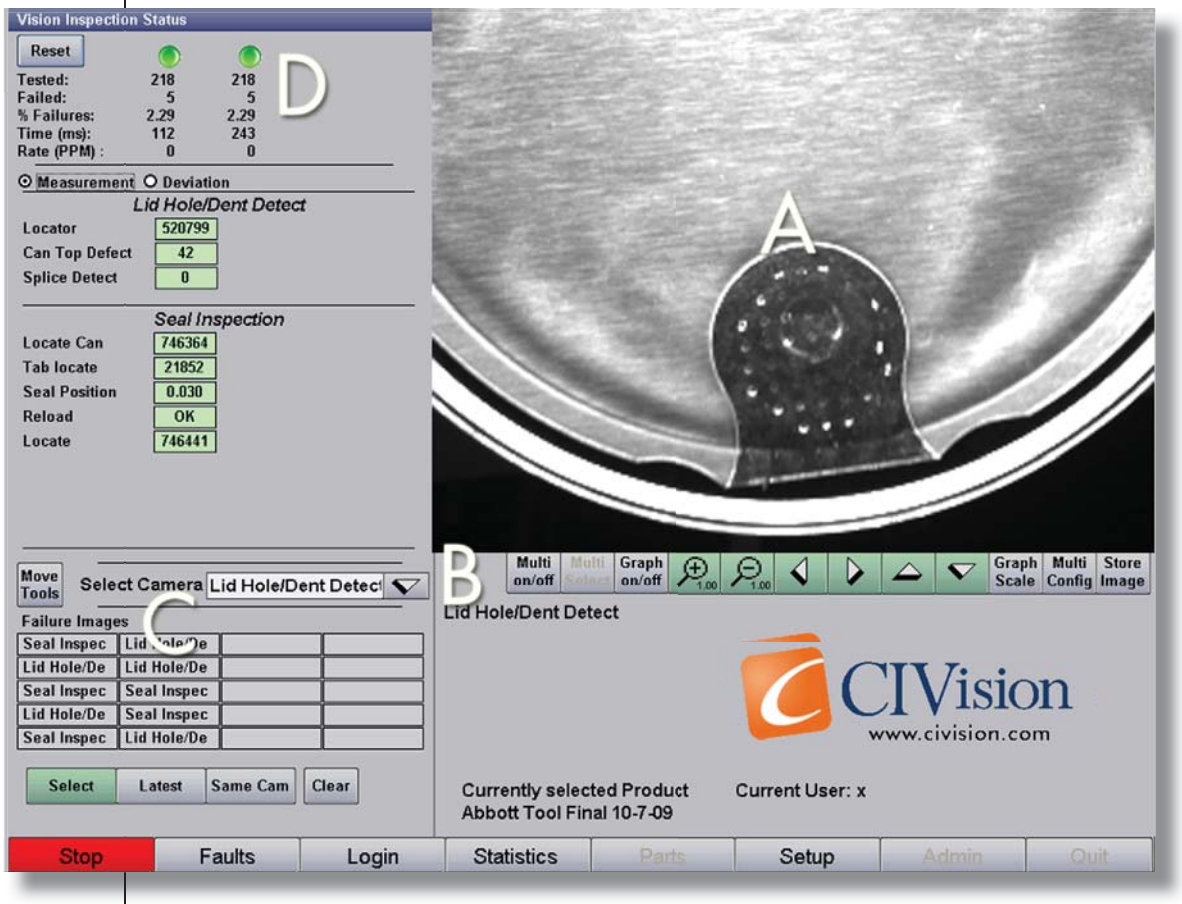
Utilizing the Run Screen - What You Are Seeing

Video Window (Single & Multi-View), Graphics Bar, Failed Images, Running Stats

Objective: Mastery of the features presented on CIVCore's Run Screen.

Reference: CIVCore 9 User's Reference Manual.

By default, as soon as an operator clicks the Run button, the inspection system displays the Run Status screen (pictured below).



The Run Status screen serves as the main interface between the user and the system while the inspection process is running. The information displayed in the different sections of the screen are updated after every completed inspection.

The Run Screen has 4 (four) main sections of interest to us today. These sections are: A) Video Window, B) Graphic Display Tool Bar, C) Failed Images, and D) Live Results.

Section A Video Display Window

The Main Work Area of the Entire System

The Video Display area is used to view live video images, stored images, and failed inspection images. It is also used to train new parts and adjust tool settings while the machine is running. More on adjusting the display in Section B below.

Configurable to Both Single and Multi-Camera Views.

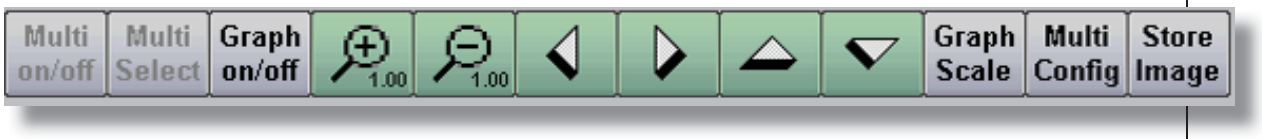
Starting with CIVCore 7, the video display window now offers the user the option of setting the display window to show up to 4 camera feeds simultaneously *(available only on systems that utilize more then 1 camera).*

> ***Note:*** *If your system does not have more then 1 camera, the multi-view feature may not be available.*

Section B Graphic Display Tool Bar

Allows User to Manipulate the Video Display

The Graphic Display Tool bar is the main tool used to manipulate the images presented in the Video Display Window. The controls (described below) allow the user to configure the display in a multitude of variations.



Multi Off/On button - View Up to 4 Images at One Time

The Multi On button when activated will turn on multiple camera views in the Video Display window. An operator may find this beneficial if the system they are using has multiple cameras with images they wish to monitor simultaneously.

> ***To turn the multi-view screen on, tap the Multi-On button***.
> Your display shouldnow have up to (4) four - 1/4 screen images.

Once Multi On is selected a Multi Off button will appear in the same location which can be activated to turn off the multiple view selection and enabling the default single camera view mode image window.

> ***To turn the multi-view screen off, tap the Multi-Off button***.
> The full sized screen feature makes it easier to make adjustments or find defects on stored failed images.

Multi-Select button - Toggle Through Four Different Multiple View Sets

The Multi-Select button allows the user to toggle through four different pre-configured multiple view sets. These multiple view sets are configured by clicking the Multi-config button *(more on page 17).*

> ***To select a Different Multi-View Screen, simply tap the Multi Select button***. Each time you click the button, the system will toggle through the next of four set-UPC. After the last configured screen has been reached, the system will display the first set again.

Graph Off/On button - Turning On/Off the Vision Tool Overlays

The Graph On/Off button will enable or disable the inspection tools' graphic overlays. The overlays (blue, green and red boxes and lines) aid the user by showing tool placement and areas of an image where failures occur.

> ***To turn Graphic Overlay On or Off tap the Graph on/off button***.

Section B Graphic Display Tool Bar (con't)

Zoom In and Zoom Out buttons - Zooming In or Out of Image

The Zoom In and Out buttons allow the user to zoom into or out of an image. This is sometimes useful when trying to place tools, adjust tolerances or when looking at failed images to see small defects.

To zoom into an image - tap the + Magnifying glass .
This will enlarge the area you are looking at. The more times you tap, the bigger the image gets.

To zoom out of an image - tap the - Magnifying glass .
This will shrink the area you are looking at. The more times you tap the button, the smaller the image gets.

Note: *This feature only works while in View Single Image mode.*

Pan Up, Down, Left & Right buttons - Moving Around a Magnified Image

While magnified, not all of the image is visible in the display window. While working on or viewing an image, a user may need to see part of the image not currently visible. These buttons are used by the system to move the image around in the window.

To view the right side of an image - tap the LEFT arrow button .
This bring more of the right side of the image into view.

To view the left side of an image - tap the RIGHT arrow button.
This bring more of the left side of the image into view.

To view the upper part of an image - tap the DOWN arrow button .
This bring more of the top side of the image into view.

To view the lower side of an image - tap the UP arrow button .
This bring more of the lower side of the image into view.

Note: *This feature only works while in View Single Image mode.*

Scale/Fine Graph button - How the Tool Graphic Overlay is Displayed

CIVCore offers the user a choice of whether the boxes and lines shown on the inspection images are thick or thin. While some of this comes down to personal preference and screen clutter, choosing Scale Graph can help the user better see the inspection process while in multi-screen view.

Note: *This button toggles between "Scale Graph" and "Fine Graph". If Fine Graph is currently being used, Scale Graph will appear on the button and visa-versa.*

To view scale lines on an inspection image - tap the Scale Graph button.

To view thin lines on an inspection image - tap the Fine Graph button.

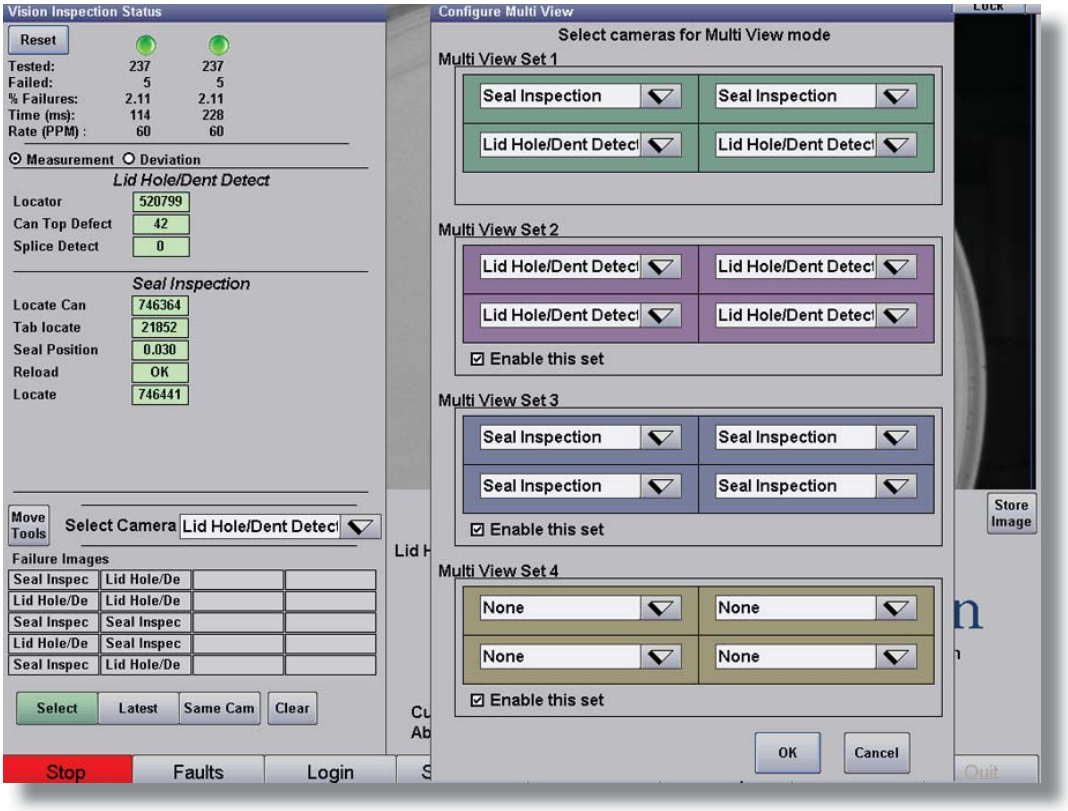
Store Image button - Saving an Image of Interest

There may come a time when, during the inspection process, a user wants to save an inspection image. This is done using the Store Image button.

To save an inspection image - tap the Store Image button.
This will save the image on the screen in the default image folder on your inspection system.

Multi-Config button - Getting Different Displays for Different Jobs

Clicking the Multi-Config button allows the user to configure the layout of the multi-view video screen.



After clicking the multi-config button, the above screen appears. This screen allows the user to choose which camera views are displayed and their screen position in the video window.

Up to four (4) separate multi-view display sets can be configured. Each set is color coded (green, purple, blue and gold) to aid the user in identifying which set they are working with. Each image window in the video display has a color label around the camera name. These colors are also utilized in the set-up window to separate the view group while configuring.

Set 1 (the default set) is the only set of the four that can not be disabled. The first (green) set will always be the first (or only) set displayed when the Multi-on/off button is pressed. If there is a need for different multi-views (another set could show only label views and another only cap or neck) use any of the three remaining views to meet these needs.

Each pulldown menu contains the names of all cameras connected to the system. The user simply selects the camera view he wants displayed in each of the locational menus in the Multi-view camera sets and clicks the OK button. Clicking the cancel button will exit multi-config screen and maintain the current view settings.

If there is no need for additional multi-view screens, simply uncheck the **Enable This Set** box in sets 2-4. Only set 1 will appear in video display window when the Multi-on/off button is pushed.

Note: *The multi-view option increases the cycle time between inspections. Therefore, multi-view may be disabled by CMvision if your vision application requires increased processing speed.*

Section C Failed Images Section.

See Why Parts Are Failing

Move Tools
Select Camera
Cam 1
Failure Images
Cam 5 Cam 5 Cam 5 Cam 5
Cam 4 Cam 4 Cam 4 Cam 4
Cam 3 Cam 3 Cam 3 Cam 3
Cam 2 Cam 2 Cam 2 Cam 2
Cam 1 Cam 1 Cam 1 Cam 1
Select
Latest
Same Cam
Clear

The failed images section of CIVCore's Run Status screen is continually updated with failed inspection images while the system is running. These images can prove to be invaluable in determining potential problems down the line before they become production stoppers.

The Failed Images section is also useful in determining whether the vision system needs to be adjusted.

Select button - Picking the Image You Want to View

The Select button is the system default icon which will allow the user to select a failed image from the failure image table. Once selected, the system will display the failed image in the **run screen's** Video Display Window.

To select and view a failed image - tap the name of image you wish to view .
The selected image will be displayed in the Video Display Area.

Latest button - Viewing the Most Current Failed Images

The Latest button will instruct the system to automatically display the newest failed images in the video display window. With this button activated, a new image will appear every time the system rejects an image.

Same Cam button - Viewing Failed Images from the Same Camera

Like the Latest button, this button will automatically display the newest failed images as they occur ONLY if they are from the same camera shown in the select camera pulldown menu.

To configure the Failed Image table to show failed images from the same camera - tap the Sam Cam button.
The table will now only contain failed images from the camera shown in the Select Camera pulldown.

Clear button - Clearing the Failed Images Table

The Clear button will delete all failed images listed in the Failure Images table.

An operator may find this beneficial to reset the system once a change in product or tool parameter is done.

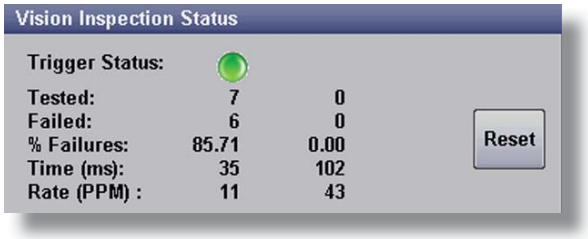
To clear the Failed Image table - tap the Clear button.
The table will now be empty of any information.

Section D Live Inspection Results

Up-to-the-Second Inspection Results

The Trigger Status section shows inspection results in real time. Each input is displayed in green if it passes inspection; yellow if there is a measurement failure; and red if there is a feature failure.

All failed images are displayed in the Failure Images list located at the bottom of the window.



Trigger Status - *Pass (Green) or Fail (Red)*

Each camera in the system has a trigger that instructs the camera to capture an image. After each of these triggers are activated, the results of the corresponding inspection are displayed in green if it passes inspection; yellow if there is a measurement failure; and red if there is a feature (tool) failure.

Tested row: Displays the total number of inspections associated with programmed trigger since the system was first started or the reset button has been clicked.

Failed row: Displays the total number of failed parts associated with programmed trigger since the system was first started or the reset button has be clicked.

% Failed row: Displays the percentage of failures associated with the programmed trigger. This is figured by dividing the total number of failures by the total number of inspections.

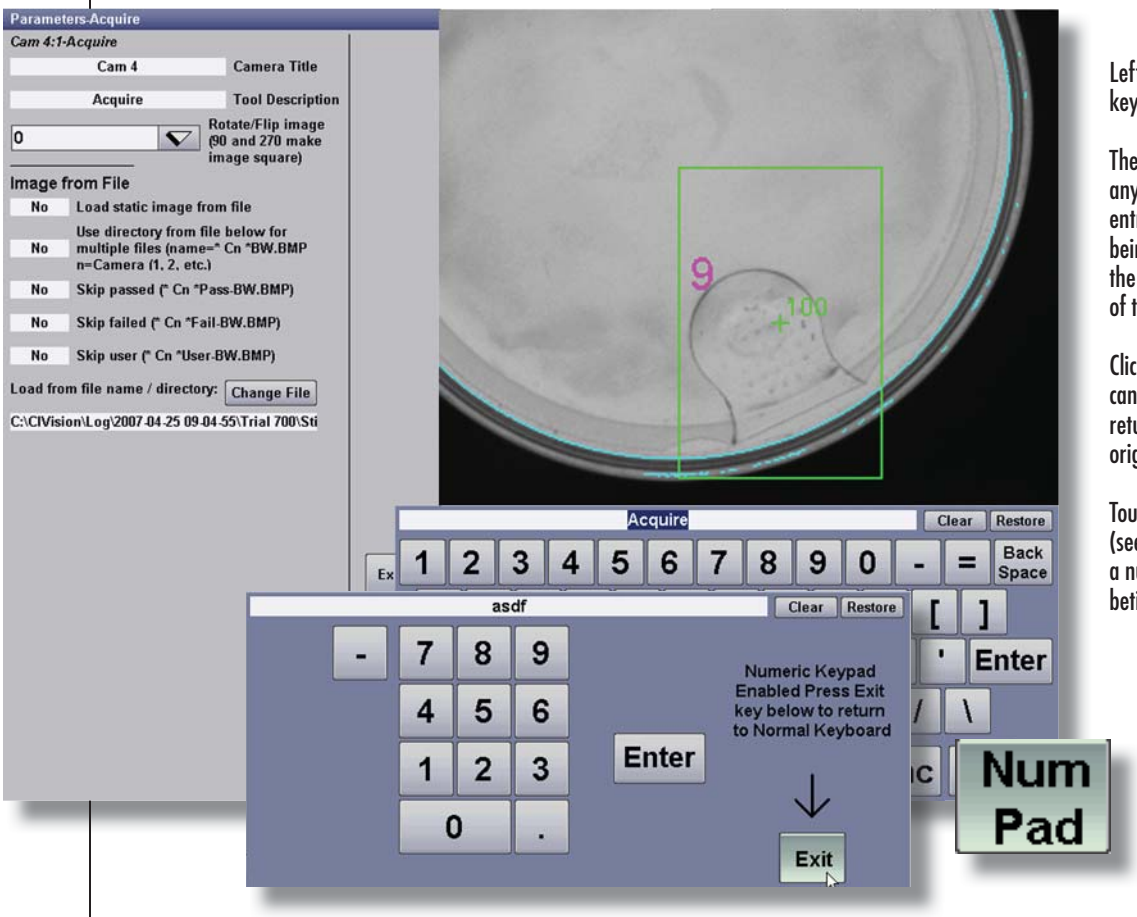
Time (ms) row: Displays the time taken to complete each inspection.

Rate (PPM) row: Displays the calculated total of parts per minute. This is a running average calculated on the last five parts inspected.

Reset button: Clicking this button will reset all of the above counts to zero.

About The Touch Screen

Most CIVCore based systems are now being configured to utilize touch screen technology. CIVCore 9's interface has been redesigned and configured to accommodate these screens.



Left: Screen with touchscreen keyboard activated.

The keyboard is activated anytime the user taps a data entry box on the screen. Text being entered is displayed in the text box located at the top of the keyboard.

Clicking the Restore button cancels the updated text and returns the text string to its original value.

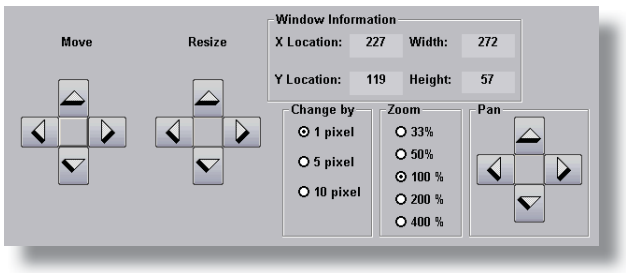
Touching the Num Pad button (see illustration) will overlay a number pad over the alphabetic keyboard.

All of the system's controls can be accessed through the touchscreen.

To activate the touchscreen, the user simply taps an area on the interface that requires input (text and alpha- numeric boxes, image re size controls). The keyboard will appear in the lower right hand corner of the screen. Input the desired information as you would on a regular keyboard and hit the Enter key. The text box being updated will now display the new information and the keyboard will disappear until activated again.

To drag or re size an item (such as setting up search areas while training a product), use the mouse to drag and re size or, for touchscreen users, use the **Move** and **Re size** buttons (shown below).

There are also buttons and controls to achieve the same results.



Example of the Move and Re size tools.

The controls pictured left can be used to re size and relocate search areas while training inspection tools.

See Update Tools section for more information on these controls.

Understanding Basic Vision Tools

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About The Vision Tools

The following pages contain screen shots, illustrations and detailed descriptions of the vision tools included with your inspection system and the tools adjustments and functionality.

The Tools built into the CIVCore Engine include:

- (Image) Acquire Tool
- Arc Gauge Tool
- Arc Unwrap Tool
- Blob Tool
- Edge Tool
- Mask Tool
- Measure Tool
- Process Tool
- Reload Tool
- Rotate Tool
- Search Tool

Note: *The tools are presented in alphabetical order and NOT in the order that they are used during the inspection process. Please see the User's Manual for tool application order.*

Not all tools are installed in your system. Since all of CIVCore's vision tools have very specific functions, some may not be needed to meet your inspection needs. Contact CIVision for more details.

Color Camera Tools

Something first introduced in CIVCore 7.2 is the implementation and support of Color Cameras. Throughout this book are color tool explanations - denoted by green text boxes. You may also notice some color controls in the system screen shots used to illustrate the following Tool Parameter section.

If you are utilizing a grey-scale inspection system, you WILL NOT see any of these tools. Only systems optimized for color image processing will have access to these controls.

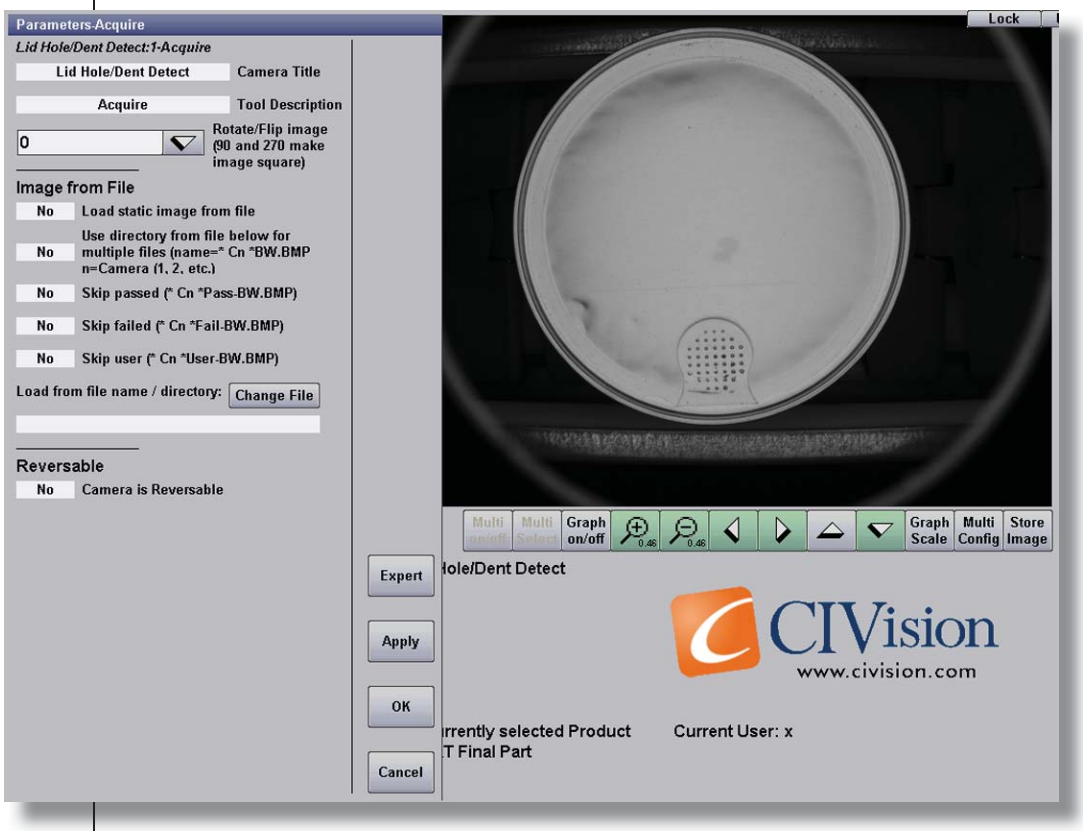
Reverse Camera Controls

The Reverse Camera tool has been installed into the Acquire Image parameter. Throughout this book are Reverse Camera explanations - denoted by blue text boxes. You may also notice some Reverse Camera controls in the system screen shots used to illustrate the following Tool Parameter section.

Unless your project has a specific need for Reverse Camera, you WILL NOT see any of these tool controls. Only systems equipped with the Reverse Camera feature will have access to these controls.

Acquire Image Tool

The Acquire Image Tool acquires a picture for the system to work with. These pictures can come from the camera itself or from a file stored in the inspection system. The parameter page described below is used to alter camera settings and set camera information.



Left: The Acquire Image Parameter Screen.

CIVCore allows the user to train the system using either the live view from the camera or a previously captured image stored on the hard drive.

To use a stored image, tap the Yes/No box next to Load Static Image from File so that it reads "Yes."

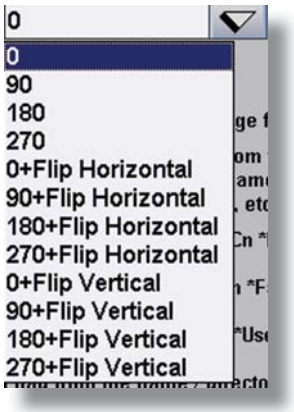
Then, tap the Change File button to find the file you wish to use. A Windows Explorer window will open. Use this to navigate to the file you wish to use.

Acquire Image Tool Parameters Screen Controls and Functionality:

Camera Title: In this cell, the user inputs the title of the current camera. Names entered into this cell will be used by the system to identify the camera in all other system functions.

Tool Description: This cell is used by the system to display the name of the tool which will show up in the Features/Tool List on the edit screen.

Rotate Image: This pulldown allows the user to change the orientation of the camera's image so that it is displayed in the video window in the usual manner. This would mainly be used if the cameras were mounted in a unique fashion because of space constraints or a special inspection requirement. This control allows for 0, 90, 180 and 270 degree rotation of the image along with horizontal & vertical adjustment *(see image at right).*



Load Static Image from File: Allows the user to load an image from a file into the system for test purposes. This only works while the system is offline:

Yes: *Allows the system to use an image loaded from a file specified in the box below.*

No: *Allows the system to only use images captured from a camera.*

Use directory from file below to: Allows the system to cycle through multiple stored images on each click of the test button:

Yes: *Allows the system to use cycle through stored images. If Yes, the system will cycle through files in the same directory as the files in the "Load from file" box below.*

No: Will not allow the system to cycle through stored images. The system will only use the image listed in "Load from file" box below.

Note: *Image files MUST adhere to the system's internal naming convention. Failure to follow this naming convention will result in frustration and a blank image window.*

Skip Passed Pics: Allows the user to determine whether the system should skip "Passed" inspection images while cycling through multiple stored images.

Yes: *Tells the system to skip over all "Passed" images.*

No: *Tells the system to not skip over "Passed" images.*

Skip Failed Pics: Allows the user to determine whether the system should skip "Failed" inspection images while cycling through multiple stored images.

Yes: Tells *the system to skip over all "Failed" images.*

No: *Tells the system to not skip over "Failed" images.*

Skip User: Allows the user to skip images stored by **Store Image** button on the Main Screen.

Load From File: Allows the user to input the path and file name of the image to be imported into the system. Tapping the **Change File** button will open an **Explorer Window.**

Reverse Camera Only

Camera is Reversable: Informs the system that this camera view has to inspect both sides of the product.

Note*: The Reversible Feature must be setup by CIVision prior to being used.*

Normal decision feature: Allows the user to enter the Feature Number of a tool which will only pass when the product is not reversed. (These feature numbers can be seen in the **Edit Features tab).**

Reversed decision feature: Allows the user to enter the Feature Number of a tool which will only pass when the product is reversed. (These feature numbers can be seen in the **Edit Features** tab).

Color Camera Only

White Balance: Allows the user to both view and change the White Balance which is automatically set by the system in the Live-Video screen. The numbers (R,G,B) are the constants that each original color channel is multiplied by to create the working image.

Gamma Correction: Allows the user to lighten dark areas of the image and wash out light areas which are set less than 1.

High Quality Bayer: Allows the user to impove the sharpness of color images and to remove false colors along the edge of objects.

Note*: Doing this will add time to the conversion process.*

Arc Gauge Tool

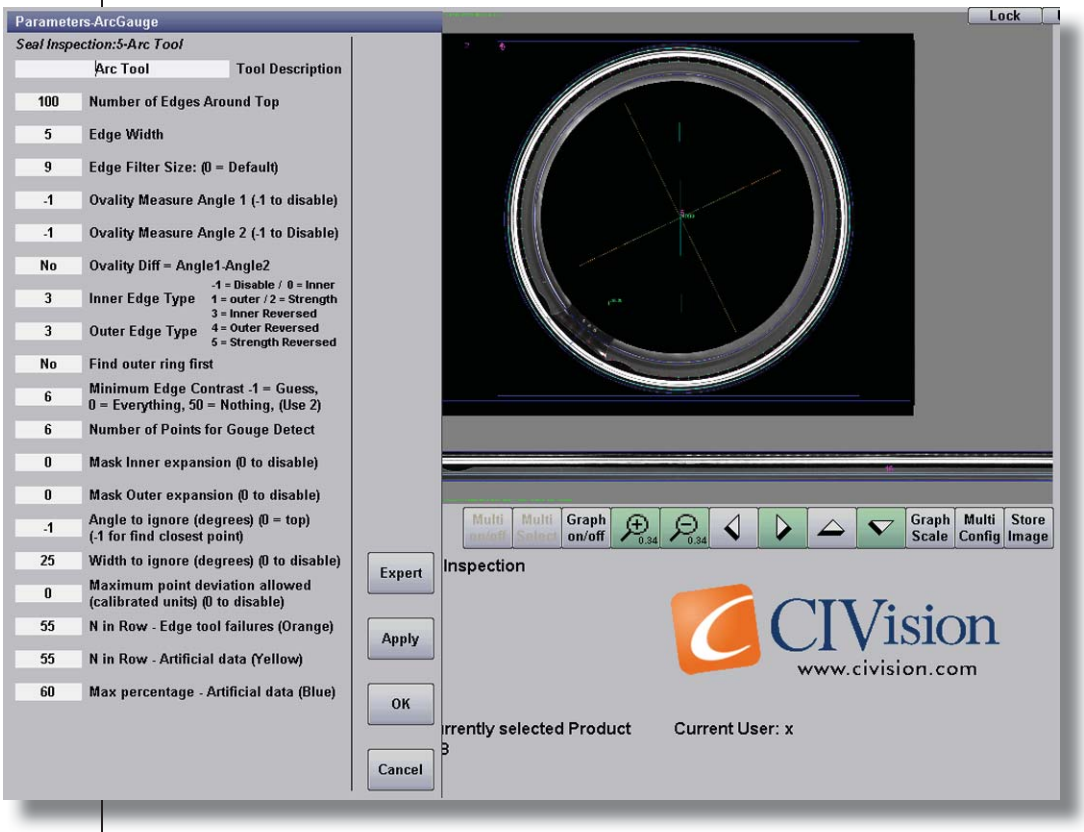
The Arc Gauge tool is used by the system to calculate inner and outer diameter of a bottle lip, to check ovality, thickness and to look for gouges that would impair a tight seal.

The Arc Gauge uses an edge tool rotated about the center of the part (result of a locator tool, often a Blob Tool) to find multiple unique points on the inner and/or outer edge of the desired area.

The arc tool can be set to look for the "Strongest Edge", the "First Inside Edge" or the "First Outside Edge".

When the arc tool is set to find the "Strongest Edge", the system will find the strongest light-to-dark or dark-to-light transition for an edge of the sealing surface. This setting will also find the largest dark-to-light and light-to-dark transition. "Strongest Edge" should not be used when other part features are visible in the Neck-Top View.

When other part features are visible, **Inside Edge** and **Outside Edge** should be used. **Inside Edge** will search from the center out to find the first proper transition *(proper being a score above the tool accept level)*. The system will then mark this edge. **Outside Edge** will search from outside towards the center to find the first proper transition *(proper being a score above the tool accept level)*. The system will then mark this edge.


Parameters-ArcGauge
Seal Inspection:5-Arc Tool
Arc Tool
Tool Description
100 Number of Edges Around Top
5 Edge Width
9 Edge Filter Size: (0 = Default)
-1 Ovality Measure Angle 1 (-1 to disable)
-1 Ovality Measure Angle 2 (-1 to Disable)
No Ovality Diff = Angle1-Angle2
3 Inner Edge Type
-1 = Disable / 0 = Inner
1 = outer / 2 = Strength
3 = Inner Reversed
3 Outer Edge Type
4 = Outer Reversed
5 = Strength Reversed
No Find outer ring first
6 Minimum Edge Contrast -1 = Guess, 0 = Everything, 50 = Nothing, (Use 2)
6 Number of Points for Gouge Detect
0 Mask Inner expansion (0 to disable)
0 Mask Outer expansion (0 to disable)
-1 Angle to ignore (degrees) (0 = top) (-1 for find closest point)
25 Width to ignore (degrees) (0 to disable)
0 Maximum point deviation allowed (calibrated units) (0 to disable)
55 N in Row - Edge tool failures (Orange)
55 N in Row - Artificial data (Yellow)
60 Max percentage - Artificial data (Blue)
Expert
Apply
OK
Cancel
Lock
Multi on/off
Multi Select
Graph on/off
Graph Scale
Multi Config
Store Image
Inspection
CIVision
www.civision.com
rrently selected Product
Current User: x

Left: The Arc Gauge Parameter Screen.

The Arc Gauge tool provides information through the graphics displayed on the screen. The data collected through the tool is used and checked through multiple measurements.

Arc Gauge Tool Parameter Screen Controls and Functionality:

The Arc Gauge tool parameters screen offers the following functions and buttons.

Tool Description: This cell is used by the system to display the name of the tool which will show up in the Features/Tool List on the edit screen.

Number of Edges Around Top: Allows the user to enter the number of Edge Tools to be run around the circular neck opening.

Using a **lower number of edges** will result in the tool running **faster**, but may result in **lower accuracy** or the system missing smaller gouges. The standard range for this setting is between 60 and 120 edges.

If a very large number is used, the tool may take excessive amounts of time which will affect the vision system's ability to keep up with product flow.

Edge Width: Allows the user to adjust the width of the Edge Tool. Making the Edge Tool wider allows the user to reduce the effects of noise.

Ovality Measure Angle 1: Allows the user to enter a value for a fixed angle to be used for measuring Ovality.

Note: *entering a value of –1 will disable this feature and instruct the system to apply the average largest/smallest value to this measurement.*

Ovality Measure Angle 2: Allows the user to enter a value for a fixed angle to be used for measuring Ovality.

Note: *Entering a value of –1 will disable this feature and instruct the system to apply the average largest/smallest value to this measurement.*

Ovality Diff = Angle 1 - Angle 2: The following scenarios apply to this field:

If a value other than –1 has been entered into both the "Ovality Measure 1 & 2" fields, then this setting adjusts how the results are calculated. With **Yes** entered in this field, the result is always **the diameter at Angle 1 minus the diameter of Angle 2**. With **No** entered in this field, the result is the **largest diameter of Angle 1 or Angle 2 minus the other diameter**. *This always gives a positive number as a result.*

If the "Ovality Measure 1 & 2" features have been disabled (-1 entered), then this feature should be set to **No**. This value will direct the system to take the difference of the largest/smallest values assigned to these measurements.

Inner Edge Type: Allows the user to enter a value for the edge tool type to be used on the inner surface of the circle.

Note: *Entering a value of –1 will instruct the tool to not search for any edge.*

Outer Edge Type: Allows the user to enter a value for the edge tool type to be used on the outer surface of the circle.

Note: *Entering a value of –1 will instruct the tool to not search for any edge.*

Find Outer Ring First: Instructs the system to search for the outer ring first and then to make sure the inner points are inside of the outer points. A "No" answer instructs the system to find the inner ring and make sure that the outer points are outside of the inner points.

Number of Points for Gouge Detect: Allows the user to input the number of points the system should use to conduct Gouge Test:

When using Gouge Detect, the system places evenly spaced points around the inner diameter of the neck. For this illustration, the system will then pick 3 adjacent points to begin the gouge detect (actual number of points used is decided by the number inputted in the Number of Points for Gouge Detect cell listed above). The system then measures the distance to each of those points from the center point of the neck.

The difference between the closest point and the farthest point is the displayed Gouge numbers.

Minimum Edge Contrast: Minimum Edge Contrast pre-filters the Edge Tool results to remove weak edges.

When Minimum Edge Contrast is set to **0**, the system does not filter weak edges, **50** filters all edges. The Default setting is **2**. ***The typical range is 0 to 8***. Setting this to 0 or 1 will substantially increase the amount of time required to process the edge tool.

Gouge Measurement Number: This number is the identifier for the gouge measurement as listed on the Measurement screen.

Mask Inner and **Mask Outer** are used by the system to mask out all parts of the image except for the sealing surface of the bottle. For normal arc tool usage, these two settings should be set to 0.

Mask Inner Number: The system will mask the center of the neck out to the inner best fit circle less the number of pixels entered into this cell. The mask will be black.

Mask Outer Number: The system will leave this number of pixels unmasked outside of the inner mask. This parameter is the thickness of the sealing surface in pixels. The rest of the image will be masked in black.

Entering "30" into this cell is the best starting point for this tool.

Angle to Ignore and **Width to Ignore** are used by the system to set up an area to ignore during all measuring activities. These would be used if a known irregularity (such as a seam) were present.

Angle to Ignore: This cell is used by the system to define a region where measurement points should not be placed - such as a parting line. This area would also be masked off if masking was enabled.

Width to Ignore: This cell is used by the system to set the size of the ignore area. The area entered here will be centered around the angle to ignore entered above.

Maximum Point Deviation, N in Row - Edge, N in Row - Artificial and **Max Percentage** are used by the system to set tolerances for the Arc tool to interpolate invalid data points and control the interpolation process. The points which are interpolated will show up darker on the screen.

Maximum Point Deviation Allowed: When this cell is not set to 0, it instructs the system to set the maximum rate of radius change allowed.

If a point is too far from the preceding point then the point will be ignored and interpolated from the remaining points. If set to low, this point will interfere with the gouge detect.

N in Row - Edge
Tool Failures: This parameter sets how many points in a row can fail before the tool will fail.

If the edge found has a score less then the tool accept value, then the edge will not be used and a point will be interpolated to fill in. If there are too many failed points in a row, the dots will show up an **orange** *color and the tool will fail.*

N in Row -
Artificial Data: This parameter sets the maximum number of interpolated points in a row before the tool is failed.

If too many interpolated points are found in a row, the dots will show up a **yellow** *color.*

Maximum %
Artificial Data: This parameter sets the maximum number of interpolated points allowed in the inner or outer circle.

If the number of interpolated points as a percentage of the total points is too high, the tool will fail and the points will be shown in a **blue** *color on the screen.*

Color Camera Only

Color Channel
to Work On: Allows the user to choose which color channel this tool will operate on.

The three channel choices listed in the pulldown menu include: ***color, intensity and saturation****.*

Note*: It is strongly advised that only persons trained in the use of these tools use this option.*

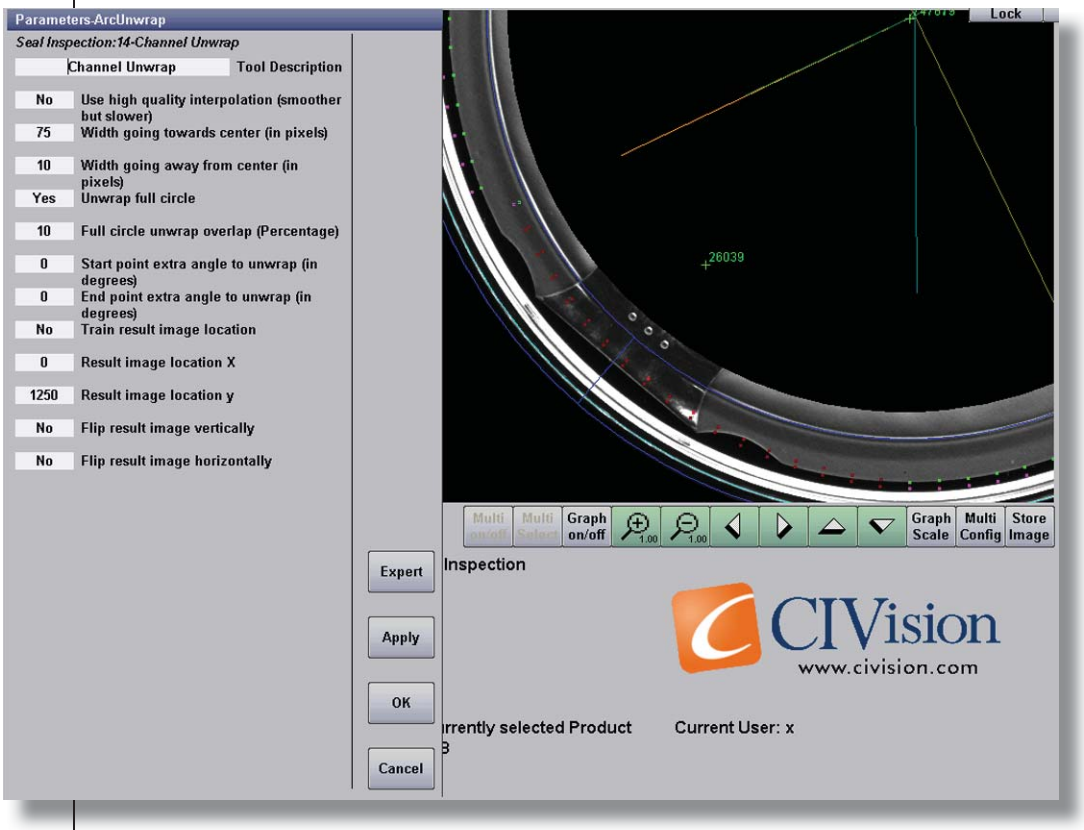
Intensity: Shows what would be seen by a grey-scale camera.

Color: Shows only the color/hue of the object.

Saturation: Shows only the vibrance of the color.

Arc Unwrap Tool

The **Arc Unwrap** tool was developed to allow tools that do not work on arcs or circles to be able to inspect arcs and circles. The tool works by unwrapping the arc or circle creating an unwrapped flat view of the circle or arc. After the **Arc Unwrap** has developed a flat image inspections can then be added on the flat image..



Left: The Arc Unwrap Parameter Screen.

Arc Unwrap Tool Parameters Screen Controls and Functionality:

Tool Description: This cell is used by the system to display the name of the tool which will show up in the Features/Tool List on the edit screen

Accept Level For First Edge Find: Selecting YES will result in a higher quality interpolation method which will result in a sharper image. Selecting Yes will take longer tov process. Depending on line/product speed will depend on whether High Quality Interpolation can be used.

Width Going Toward Center: This value in pixel determines from chosen arc/circle how far inside the arc/circle the image will choose to unwrap. The chosen arc/circle is determined during training the tool using the red cross hairs.

Width Going Away From Center: This value in pixel determines from chosen arc/circle how far outside the arc/circle the image will choose to unwrap. The chosen arc/circle is determined during training the tool using the red cross hairs.

Unwrap Full Circle: Selecting YES will tell the system that a full circle is to be unwrapped. Selecting NO will tell the system that an arc is to be unwrapped.

Full Circle Unwrap Overlap: This determines in percentage how much more of the image will be added to the ending of the unwrapped Image. Default is usually 10%.

Start Point Extra Angle to Unwrap: This value in degrees determines how much more will be added to the unwrapped image before the chosen start of the arc/circle. Both Start Point and End Point Should be used together. Start Point should be set to 0 if using Full Circle Unwrap Overlap.

End Point Extra Angle to Unwrap: This value in degrees determines how much more will be added to the unwrapped image past the chosen end of the arc/circle. Both Start Point and End Point Should be used together. End Point should be set to 0 if using Full Circle Unwrap Overlap.

Trained Result Image Location: Selecting YES will give the user an extra cross hair during training the tool. This cross hair will allow the user to determine the placement of the unwrapped image. After the tool is trained the Result Image Location X and Y will be filled in automatically if YES is selected.

Result Image Location X: This parameter allows the user to move or place the unwrapped image in the vertical axis. Value is in pixels.

Result Image Location Y: This parameter allows the user to move or place the unwrapped image in the horizontal axis. Value is in pixels.

Flip Result Image Vertically: Selecting YES will mirror the result images from top to bottom.

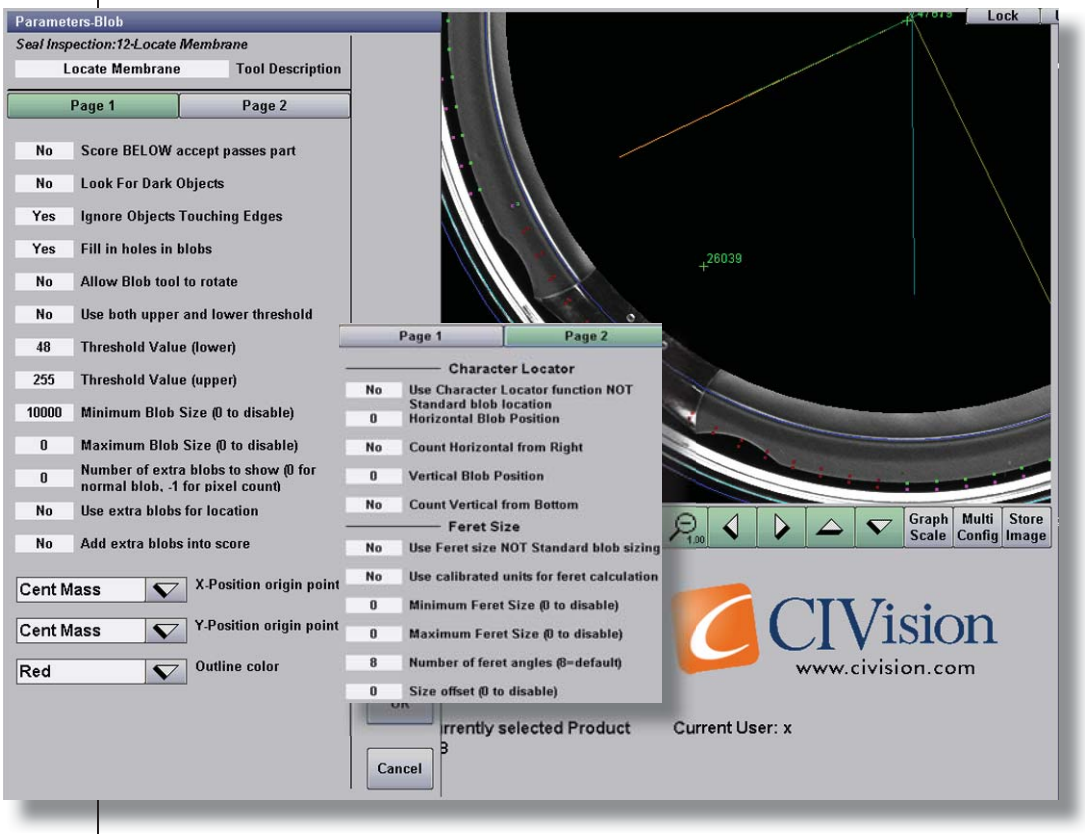
Flip Result Image Horizontal: Selecting YES will mirror the result images from left to right.

Blob Tools

Blob tools are used to find features which may be odd shaped and change shape from inspection to inspection. The blob tool does this by thresholding the image and finding pixels of the same color which are touching each other. A threshold level needs to be set for the blob tool.

Starting in CIVCore 7.0, the threshold tool runs in 2 modes. The first mode uses a single set-point. Anything above or below that set-point is selected by the tool. The second mode utilizes two set points. Anything between OR outside of these points gets selected.

Thresholding sets all pixels greater-or-equal to the threshold value to white, and all pixels less-than the threshold value to black. A blob tool groups all the black pixels (in the threshold area) into blobs (which are defined as pixels which touch each other). The blob tool then filters the groups using the settings in the parameters screen. After filtering the tool returns the center and size of the chosen blob (or blobs).


Parameters-Blob
Seal Inspection:12-Locate Membrane
Locate Membrane
Tool Description
Page 1
Page 2
No Score BELOW accept passes part
No Look For Dark Objects
Yes Ignore Objects Touching Edges
Yes Fill in holes in blobs
No Allow Blob tool to rotate
No Use both upper and lower threshold
48 Threshold Value (lower)
255 Threshold Value (upper)
10000 Minimum Blob Size (0 to disable)
0 Maximum Blob Size (0 to disable)
0 Number of extra blobs to show (0 for normal blob, -1 for pixel count)
No Use extra blobs for location
No Add extra blobs into score
Cent Mass X-Position origin point
Cent Mass Y-Position origin point
Red Outline color
Page 1
Page 2
Character Locator
No Use Character Locator function NOT Standard blob location
0 Horizontal Blob Position
No Count Horizontal from Right
0 Vertical Blob Position
No Count Vertical from Bottom
Feret Size
No Use Feret size NOT Standard blob sizing
No Use calibrated units for feret calculation
0 Minimum Feret Size (0 to disable)
0 Maximum Feret Size (0 to disable)
8 Number of feret angles (8=default)
0 Size offset (0 to disable)
Lock
Graph Scale
Multi Config
Store Image
CIVision
www.civision.com
Current User: x
Cancel

Left: The Blob Tool Parameter Screen.

Additional features are added to the Blob tool by selecting the Page 2 button (see insert to view second page).

Blob Tool Parameters Screen Controls and Functionality:

The Blob tool parameter screen offers the following functions and buttons.

Tool Description: This cell is used by the system to display the name of the tool which will show up in the Features/Tool List on the edit screen.

Page 1: pressing the Page 1 button will display the following parameters:

Score Below Accept
Passes Part: complete this box with Yes or No:

Yes: States the user wants to pass parts whose score is below the Accept level.

No: States the user wants to fail parts whose score is below the Accept l.evel.

Look For Dark Objects: complete this box with Yes or No:

Yes: Tells the system that the user wants the system to search for dark objects.

No: Tells the system that the user wants the system to search for light objects.

Ignore Objects Touching Edge: complete this box with Yes or No:

Yes: A ***Yes*** response will tell the system to ignore blobs that touch the edge of the selected area.

No: A ***No*** response will tell the system to utilize blobs that touch the edge of the selected area.

Fill in Holes In Blob: This option is used while trying to measure the size and/or location of the blob. It is used if the measurement could be affected by white space.

Yes: Tells the system the user wants the system to fill holes in blob

No: Tells the system the user doesn't want the system to fill holes in blob.

Allow Blob Tool to Rotate: complete this box with Yes or No:

Yes: Blob tool will move around on the screen as its fixture moves and the blob rectangle will rotate to match the angle from it's fixtures. This mode will operate approximately twice as slowly.

No: Blob tool will move around on the screen as its fixture moves but the blob rectangle will not rotate. This is the **default behavior** and the fastest.

Use Both Upper and Lower Thresholds: complete this box with Yes or No:

Yes: Blob tool will use both upper and lower thresholds. This mode will allow the system to threshold between set values as opposed to above or below a value.

No: Blob tool will only use a single threshold value. Everything above this value will be set to white and everything below to black.

Threshold Value (lower): This option allows the user to set the lower threshold value of the pixels. Pixels in the original image with grey values above this value will be set to white, and pixels with grey values below this value will be set to black.

Threshold Value (upper): This option allows the user to set the upper threshold value of the pixels. Pixels in the original image with grey values above this value will be set to black, and pixels with grey values below this value will be set to white.

Minimum Blob Size (0 to disable): The system will ignore blobs smaller than the specified size.

Maximum Blob Size (0 to disable): The system will ignore blobs larger than the specified size.

Number of Extra Blobs to Show: Allows the blob tool to find extra blobs besides the largest. The number in the box will set the maximum number of extra blobs to be found. If there aren't as many blobs as what is shown in the box, no error will occur, and the blob tool will simply stop looking. Using ***-1*** disables most blob functions and makes the tool simply count the number of pixels that meet the threshold criteria.

Use Extra Blobs for Location: If Yes, the blob tool will take a weighted average of all the blob locations found and use the result as the tool location. If No, the Largest blob will be used for the tool location.

Add Extra Blobs to Score: If Yes, the size of all blobs found will be added together and used for the score. If No, only the size of the largest blob will be used for the blob too score.

X-Position Origin Point pulldown: Allows the user to tell the system where result location is found in the X-position. Pulldown menu includes: *Center of Mass, Center of Box, Left Edge and Right Edge.*

Y-Position Origin Point pulldown: Allows the user to tell the system where result location is found in the Y-position. Pulldown menu includes: *Center of Mass, Center of Box, Top Edge and Bottom Edge.*

Outline Color pulldown: Allows the user to choose the outline color of the tool as it will appear on the screen during run-time. This can be extremely helpful if you are running more then one blob tool - it makes it easier to identify the tools as the system is running.

Color Camera Only

Color Channel to Work On: Allows the user to choose which color channel this tool will operate on.

The three channel choices listed in the pulldown menu include: ***color, intensity and saturation****.*

Note*: It is strongly advised that only persons trained in the use of these tools use this option.*

Intensity: Shows what would be seen by a grey-scale camera.

Color: Shows only the color/hue of the object.

Saturation: Shows only the vibrance of the color.

Page 2: pressing the Page 2 button will display the following parameters:

"Character Locator" ***the portion of the parameter screen directly below this option will change based upon this setting.***

Use Character Locator = No

Use Character Locator Not Standard: If ***Yes*** is selected, the system will switch to Character Locator function instead of the default Standard blob location function. The Character Locator functionality would be used when using the OCV Tools *(Not all systems use the built-in OCV capabilities).*

Horizontal Blob Position: The character you wish to choose counted either from the right or left. One (1) will choose the first character in the line.

Count Horizontal from Right: A ***Yes*** response forces the counting to start with character 1 at the right and count moving towards the left (reverse of normal reading).

Vertical Blob Position: The character you wish to choose counted either from the top or bottom. One (1) will choose the topmost or bottommost line.

Count Vertical from Bottom: A ***Yes*** response forces the counting to start with character 1 to be in the bottom-most line and count moving up lines. (reverse of normal reading).

Use Character Locator = Yes

Horizontal Blob Position: The character you wish to choose counted either from the right or left. One (1) will choose the first character in the line.

Count Horizontal from Right: A ***Yes*** response forces the counting to start with character 1 at the right and count moving towards the left (reverse of normal reading).

Vertical Blob Position: The character you wish to choose counted either from the top or bottom. One (1) will choose the topmost or bottommost line.

Count Vertical from Bottom: A ***Yes*** response forces the counting to start with character 1 to be in the bottom-most line and count moving up lines. (reverse of normal reading).

"Feret Size"

Use Feret Size Not Standard Blob Size: If ***Yes*** is selected, the tool will measure blobs by finding the longest axis of the blob and measuring it.

Use Calibrated Units For Feret Calculation: complete this box with Yes or No:

Yes: If Yes is selected, the result of the Feret measurements are displayed in calibrated units.

No: If No is chosen, the same measurements are displayed in pixels.

Minimum Feret Size (0 to disable): The system will filter the smallest blob to look at.

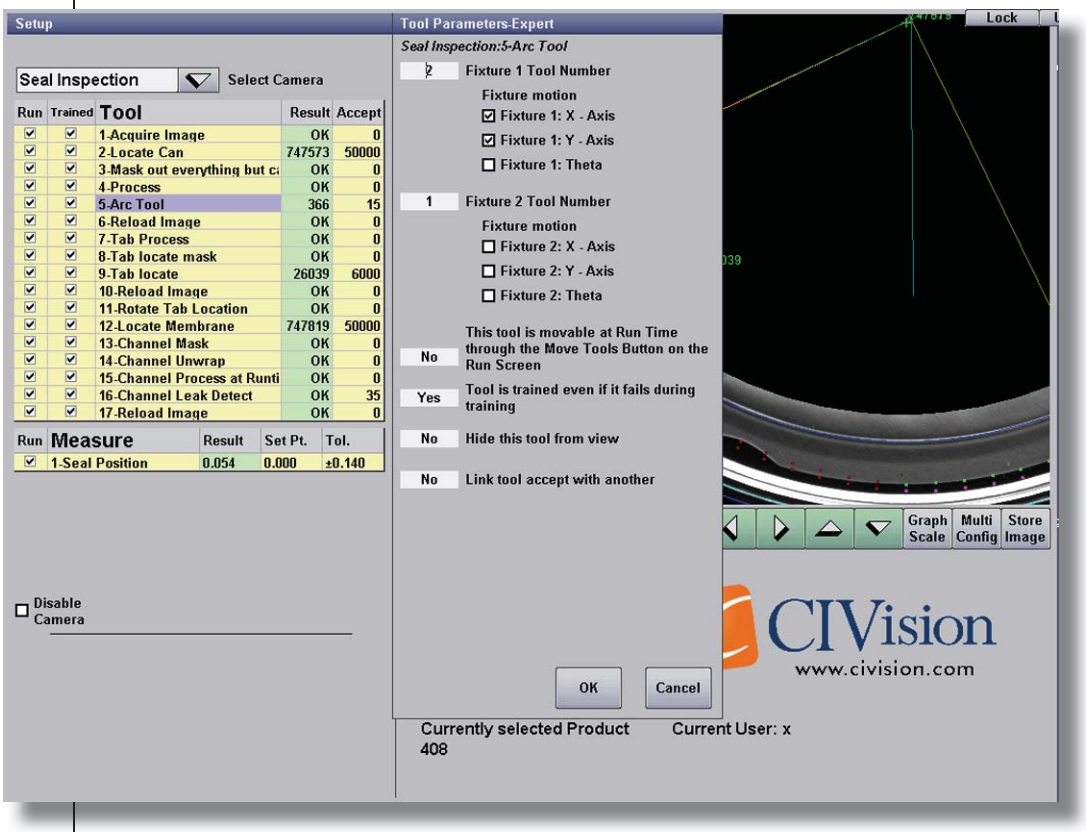
Maximum Feret Size (0 to disable): The system will filter the largest blob to look at.

Number Of Feret Angles (8 = default): The system sets the number of different angles used in checking the size of the blobs. Larger numbers will give more accurate results at the expense of speed.

Size Offset (0 to disable): This offset number is added to the found blob sizes. This can be used to offset the changes is blob sizes due to processing.

Expert Tool

The Expert tool is used to link or fix one tool to another, so that at run time the tools can move around on the screen to follow the product movement.



Left: The Tool Parameter - Expert Screen.

The Tool Parameter-Expert screen is available for all of the tools listed in the tool list.

Expert Parameters Screen Controls and Functionality:

The Expert Parameters screen offers the following functions and buttons.

Fixture 1 Tool Number: Allows the user to select the first fixturing point and select the check boxes below for axis attachment.

Note: *Setting this number to 1 (one) will disable this fixture point.*

Fixture 2 Tool Number: Allows the user to select the second fixturing point and select the check boxes below for axis attachment.

Note: *Setting this number to 1 (one) will disable this fixture point.*

This Tool is Movable: This feature is helpful in the fine tuning of the search area.

Yes: Allows this tool to be moved during "run mode."

No: Will not allow this tool to be moved during "run mode."

Tool is Trained even if it fails during: Allows a tool to be trained on a bad image and fail during training.

This option is not recommended except for advanced users.

Reverse Camera Only

Tool Trains on Reverse Image: For reversible products. When Yes it indicates this tool is only used when the product is in the system in the reversed orientation.

Hide this Tool from View: Allows the user to remove this feature from the feature list.

In order to have this feature listed in the feature list again, the user must check the "Show All Tools" button on the advanced tab in the edit screen. This tool should be disabled before checking "Show all tools".

This option is not recommended except for advanced users.

Link Tool Accept with Another: This feature is used to link accept levels of multiple tools together. *(This should only be used by CIVision, Inc.) If* ***Yes*** *is entered, the following features are made available.*

Camera to Link With: This feature is used to link the tool to a specific camera. Any tool can be linked to any active camera. *(This should only be used by CIVision, Inc).*

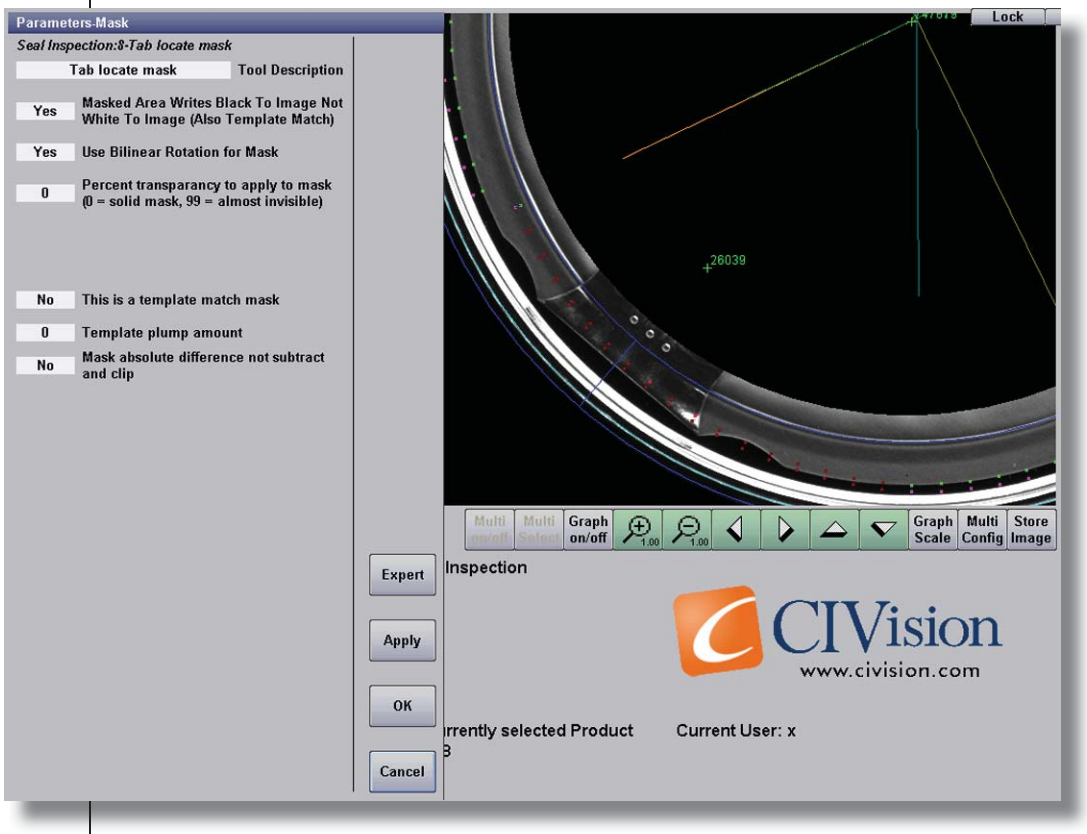
Fixture # to Link With: This feature is used to link accept level of the tool to another tool (feature) If a change is made in one feature, the change will appear in all features linked to it.*(This should only be used by CIVision, llc.).*

Hide this Fixture from View: Allows the user to remove this fixture from the fixtures list.

Mask Tool

The Mask tool is used to block out unwanted areas of an image. The Mask tool can be used to put black or white pixels over the original image.

Example of when to use - A search area may overlap a section of the product being inspected that may skew the results of the search. Applying a mask to block this area off would correct the problem.



Left: The Mask Tool Parameter Screen.

Template Matching

New in CIVCore 9 is the ability to mask off large parts of an original image- leaving only defects behind to be detected by the system. This is called Template Matching.

Mask Tool Parameters Screen Controls and Functionality:

The Mask Tool Parameters screen offers the following functions and buttons.

Tool Description: This cell is used by the system to display the name of the tool which will show up in the Features/Tool List on the edit screen.

Masked Area Writes Black to Image: Complete this box with Yes or No. Set to Yes for Template Match.

- ***Yes:*** Instructs the mask tool to apply black pixels to this image. *Set to Yes for Template Match.*
- ***No:*** Instructs the mask tool to apply white pixels to the image.

Use Bilinear Rotation for Mask: Complete this box with Yes or No.

- ***Yes:*** Instructs the mask tool to rotate the image using a bilinear rotation algorithm. This setting is the slower but much more accurate and is the recommended setting UNLESS system speed is a problem.

% Transparency to Apply to Mask: This feature allows the user to set the transparency of the applied mask by entering a number between 0 and 99 (0 = solid mask {default}, 99 = almost invisible). ***Set to 0 for Template Match.***

This setting is useful when trying to lighten or darken an object in the inspection field.

Color Camera Only

Color Channel to Work On: Allows the user to choose which color channel this tool will operate on.

The three channel choices listed in the pulldown menu include: ***color, intensity and saturation.***

Note*: It is strongly advised that only persons trained in the use of these tools use this option.*

- **Intensity:** Shows what would be seen by a grey-scale camera.
- **Color:** Shows only the color/hue of the object.
- **Saturation:** Shows only the vibrance of the color.

This is a Template Match Mask: This feature instructs the system as to whether it is going to use the mask to match a pattern or to hide elements of the inspection image.

- ***Yes:*** Stores the original image and subtract it from the run image to leave only the defects visible on the display.
- ***No:*** Lets the user paint the mask to be used.

Template Plump Amount: This feature sets the number of pixels the white parts of the template should be expanded. This allows slight variation in product printing or placement to not show up as defects.

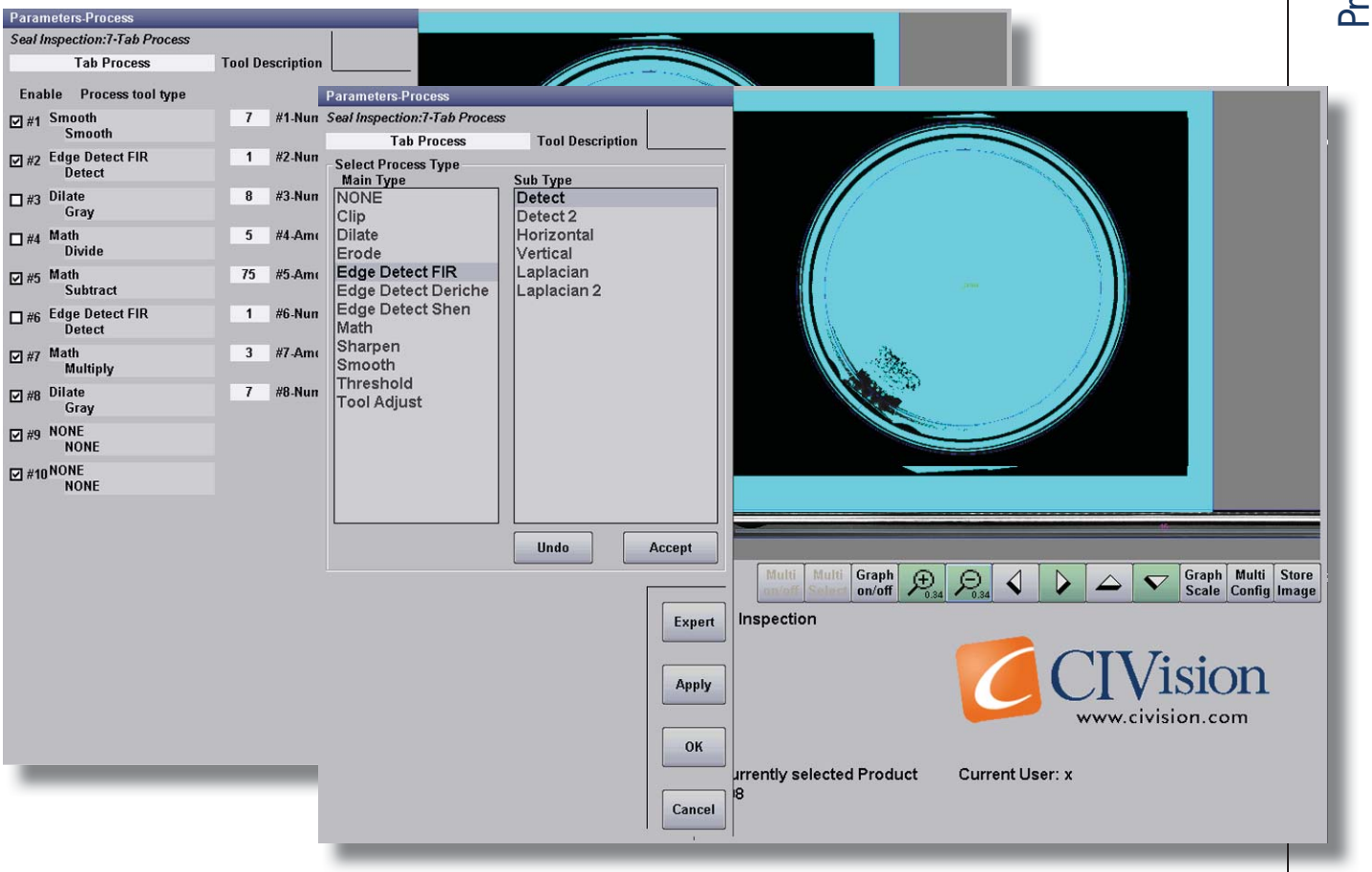
Mask Absolute Difference: This cell instructs the system in how the template mask should be applied to the run image.

- ***Yes:*** Delivers an image which shows how different the run image is from the trained image. This shows parts which are too dark or too light. ***This setting can't be used with plumping.***
- ***No:*** Delivers an image which shows only the areas in the run image which are brighter than the trained image. **This setting works**

Process Tool

The Process Tool allows the system user to process a specific region of an image to prepare it for use by another inspection tool. The system user designates the area to be "processed" while training the product into the system.

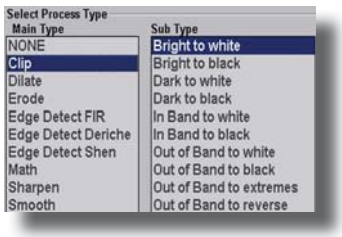
As demonstrated below, the Process Tool can be trained to use up to ten (10) processes to manipulate an image in preparing it for use by another tool. Each of the ten (10) pulldowns offer the user specific processes to choose from. Each process, subsequently, offers supporting sub-processes. When activated, the system will start at the top of the pulldown list and complete the processing tasks from the top to bottom.



Process Tool Parameters Screen Controls and Functionality:

The "Enable" check boxes allow the user to disable certain processing functions without removing their parameters from the screen. This function is useful in testing situations to see what effects certain processes are having on the image. Under each of the 10 pulldown menus, "NONE" is the default setting. Details on the main process types are as follows:

"Clip"



Left: Clip Pulldown. Use this to choose the desired sub type for the main Clip process parameter.

Bright to White: Pixel values greater than parameter will be changed to 255 (white).

Bright to Black: Pixel values greater than parameter will be changed to 0 (black)).

Dark to White: Pixel values less than parameter will be changed to 255 (white).

Dark to Black: Pixel values less than parameter will be changed to 0 (black).

In Band to White: Pixel values which fall between parameter 1 and parameter 2 will changed to 255 (white).

In Band to Black: Pixel values which fall between parameter 1 and parameter 2 will changed to 0 (black).

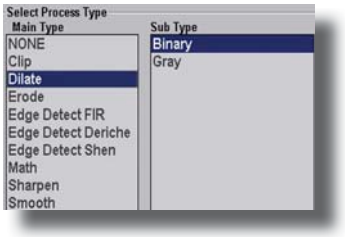
Out of Band to White: Pixel values which are less than parameter 1 or greater than parameter 2 will be changed to 255 (white).

Out of Band to Black: Pixel values which are less than parameter 1 or greater than parameter 2 will be changed to 0 (black).

Out of Band to Extreme: Pixel values which are less than parameter 1 will be changed to 0 (black) and pixel values which are greater than parameter 2 will be changed to 255 (white).

Out of Band to Reverse: Pixel values which are less than parameter 1 will be changed to 255 (white) and pixel values which are greater than parameter 2 will be changed to 0 (black).

"Dilate"

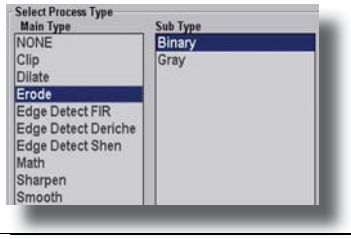


Left: Dilate Pulldown. Use this to choose the desired sub type for the main Dilate process parameter.

Binary: Makes white areas of the image larger - used for binary (threshold images).

Gray: Makes white areas of the image larger - used for Greyscale images.

"Erode"

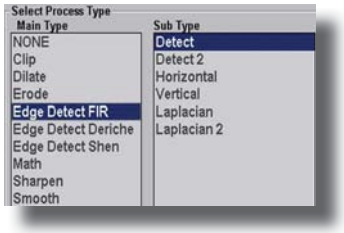


Left: Erode Pulldown. Use this to choose the desired sub type for the main Erode process parameter.

Binary: Makes white areas of the image smaller - used for binary (threshold images).

Gray: Makes white areas of the image smaller - used for Greyscale images.

"Edge Detect FIR"



Left: Edge Detect FIR Pulldown. Use this to choose the desired sub type for the main Edge Detect FIR process parameter.

Detect: Produces an image that is all black accept for the edges that are displayed as white.

Detect2: Produces an image that is all black accept for the edges that are displayed as white. Detect2 uses a different algorithm that is similar to edge detect.

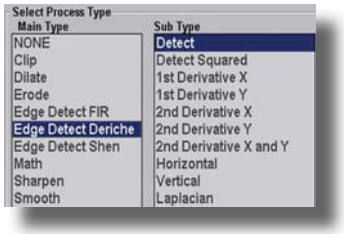
Horizontal: Similar to edge detect except it highlights horizontal edges only.

Vertical: Similar to edge detect except it highlights vertical edges only.

Laplacian: Similar to edge detect but uses a different algorithm.

Laplacian2: Similar to edge detect but uses a different strength algorithm.

"Edge Detect Deriche"



Left: Edge Detect Deriche Pulldown. Use this to choose the desired sub type for the main Edge Detect Deriche process parameter.

Detect: Produces an image that is all black accept for the edges that are displayed as white.

Detect Squared: Similar to Detect, except that the system will find stronger edges.

1st Derivative X: No edges are shown a grey. Left vertical edges are white and right vertical edges are black.

1st Derivative Y: No edges are shown a grey. Top Horizontal edges are white and bottom horizontal edges are black.

2nd Derivative X: No edges are shown as grey. Vertical edges have white on the dark side of the edge and black on the white side of the edge.

2nd Derivative Y: No edges are shown as grey. Horizontal edges have white on the dark side of the edge and black on the white side of the edge.

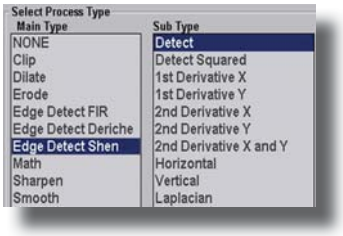
2nd Derivative X and Y: No edges are shown as grey. Small features are highlighted, while large features are suppressed.

Horizontal: Similar to edge detect except it highlights horizontal edges only.

Vertical: Similar to edge detect except it highlights vertical edges only.

Laplacian: Similar to edge detect but uses a different algorithm.

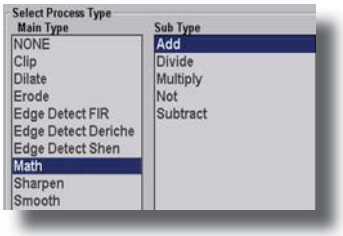
"Edge Detect Shen"



Left: Edge Detect Shen Pulldown. Use this to choose the desired sub type for the main Edge Detect Shen process parameter.

The sub types for this feature function in the same manner as the previous edge detect, however a different algorithm is used in the calculation.

"Math"



Left: Math Pulldown. Use this to choose the desired sub type for the main Math process parameter.

Add: Adds a constant value to each pixel in an image.

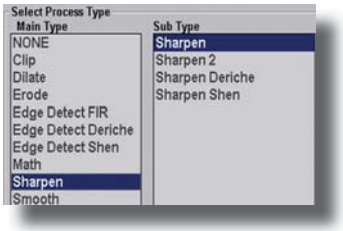
Divide: Divides each pixel in an image by a constant.

Multiply: Multiplies each pixel by a constant. Often used to brighten up an image.

Not: Used to invert an image. Dark pixels lighten up and light pixels darken up.

Subtract: Subtracts a constant value to each pixel in an image.

"Sharpen"



Left: Sharpen Pulldown. Use this to choose the desired sub type for the main Sharpen process parameter.

Sharpen: Increases contrast of edges.

Sharpen2: Increases contrast of edges using a different algorithm. Sharpen2 is stronger then Sharpen.

Sharpen Deriche: Calculates this feature using the "Direch" algorithm, which will offer a different result.

Sharpen Shen: Calculates this feature using the "Shen" algorithm, which will offer a different result.

"Smooth"

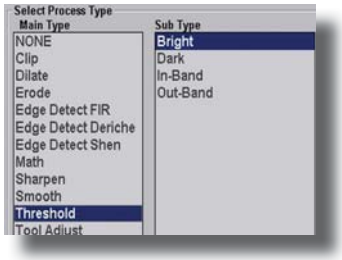
Left: Smooth Pulldown. Use this to choose the desired sub type for the main Smooth process parameter.

Smooth: Blurs an image by averaging by averaging neighboring pixels.

Smooth Deriche: Calculates this feature using the "Direch" algorithm, which will offer a different result.

Smooth Shen: Calculates this feature using the "Shen" algorithm, which will offer a different result.

"Threshold"



Left: Threshold Pulldown. Use this to choose the desired sub type for the main Threshold process parameter.

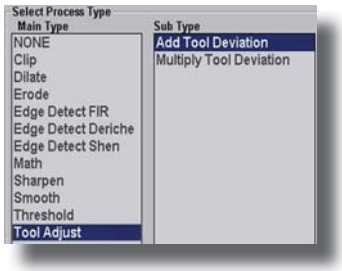
Bright: Pixel values which are greater than or equal to Parameter 1 are changed to 1 and other pixels are changed to 0.

Dark: Pixel values which are less than or equal to Parameter 1 are changed to 1 and other pixels are changed to 0.

In-Band: Pixel values which are greater than Parameter 1 and less than Parameter 2 are changed to 1 and other pixels are changed to 0.

Out-Band: Pixel values which are less than Parameter 1 and greater than Parameter 2 are changed to 1 and other pixels are changed to 0.

"Tool Adust"



Left: Tool Adjust Pulldown. Use this to choose the desired sub type for the main Tool Adjust process parameter.

Add Tool Deviation: The system adds the difference in the tool scores from the trained image to either lighten or darken the current image.

Multiply Tool Deviation: The system multiplies the difference in the tool scores from the trained image to either lighten or darken the current image.

Reload Tool

During a typical inspection, some tools (such as the Process and Mask tools) alter the inspection image. The Reload tool works with these altered images in two very different ways.

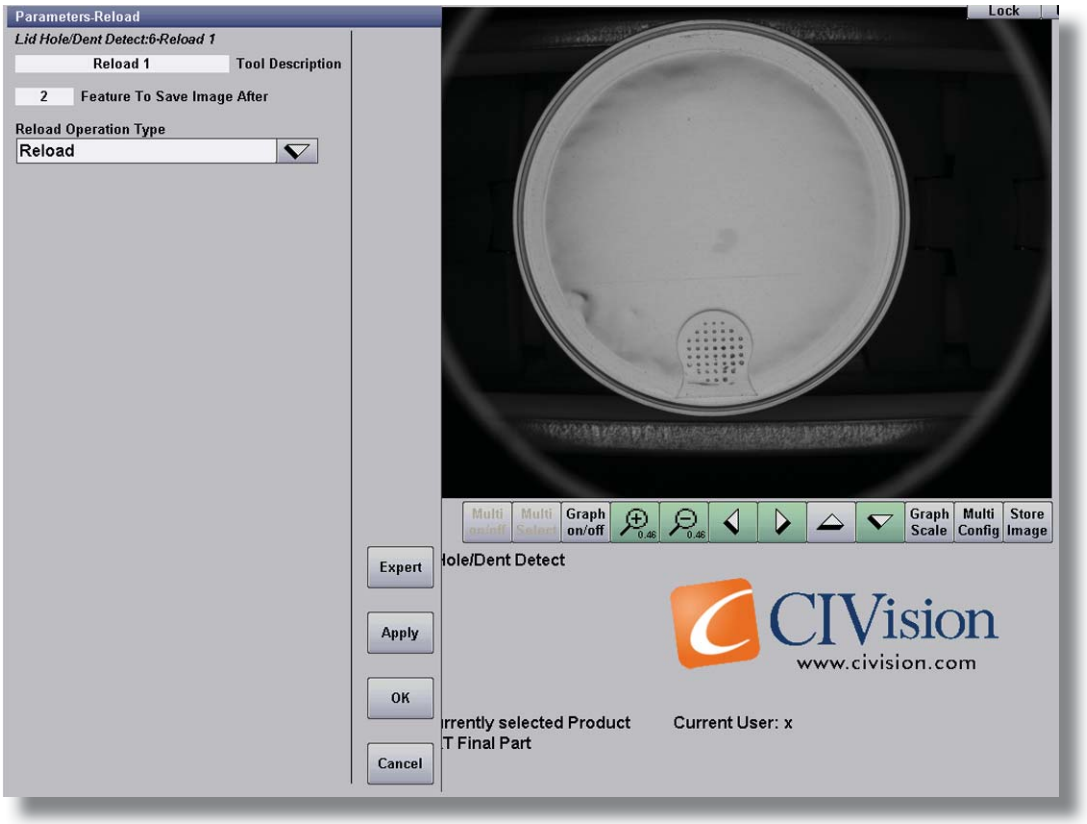
In order for most vision tools to function, the original inspection image must be reloaded. The first function of the Reload tool is that it reloads the original inspection image into the system after running various inspection tools. This allows the other vision tools to do their work.

In performing its second function, the Reload tool combines an altered image with the original image. In some specialized applications, *(such as wrinkle or dart detect)* multiple reload tools may be used to build an inspection image with multiple layers. The reload tool allows for this altering and stacking of multiple images.

Right: The Reload Tool Screen with Reload Operation Type pulldown open.

The Reload Tool started out as a clean up tool to restore images altered by other tools. Now, it has gained a bunch of new capabilities.

Read on to learn more about these added capabilities.



Reload Tool Parameters Screen Controls and Functionality:

The Reload Tool Parameters screen offers the following functions and buttons.

Tool Description: Used by the system to display the name of the tool which will show up in the Features/Tool List on the edit screen.

Feature to Save Image After: Allows the user to input which step in the inspection process the reload should save the image.

Reload Operation Type Pulldown

Reload Operation Type pulldown: Allows the user to choose what function they would like the Reload Tool to perform. The following definitions describe what each function does.

Reload: Reload the original inspection image into the system. This is typically done after a masking or process tool function.

Brightest: The Result Image is created by taking the **brightest pixels** between the current and stored images. This is useful when combining multiple white defect images.

Darkest: The Result Image is created by taking the **darkest pixels** between the current and stored images.

Add: The Result Image is created by ***adding the pixel values of the current and stored images***. *If the value is > 255, the value is then clipped to 255.*

Subtract First: The Result Image is created by **subtracting the pixel values** of the stored image from the current images. *If the value the subtracted value is <0, then the value is clipped to 0.*

Subtract Second: The Result Image is created by ***subtracting the pixel values of the current image from the stored images.*** *If the value the subtracted value is <0, then the value is clipped to 0.*

Difference: The Result Image is created by ***subtracting the smaller pixel value from the larger pixel value*** between the current and stored images.

Multiply: The Result Image is created by ***multiplying the pixel values*** of the current and stored images.

Divide First: The Result Image is created by ***dividing the pixel values*** of the stored image by the pixel value of the current image.

Divide Second: The Result Image is created by ***dividing the pixel values*** of the current image by the pixel value of the stored image.

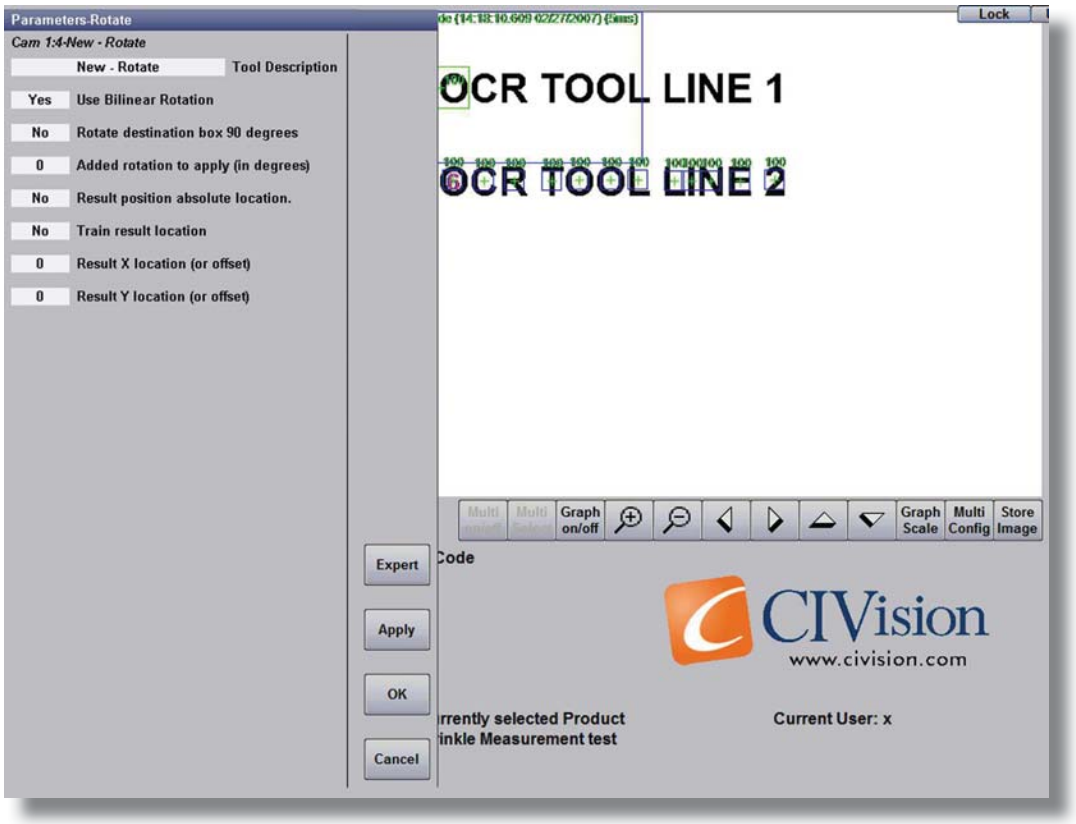
Rotate Tool

The Rotate Tool is used by the system to modify an inspection image by rotating a portion of it to aid another inspection tool. An example of when you would use this tool is when you had two strings of text, positioned perpendicular to each other, and you needed to read them both with the same camera. *Note: The system can only recognize and read text strings running from left to right.* You would use the Rotate Tool to select and rotate the vertically positioned text string so that it runs parallel to the text string running left to right.

This tool is rarely utilized.

Right: The Rotate Tool Screen .

The Rotate tool may be used to rotate a portion of an image back to vertical for other tools to use.



Rotate Tool Parameters Screen Controls and Functionality:

The Rotate Tool Parameters screen offers the following functions and buttons.

Tool Description: This cell is used by the system to display the name of the tool which will show up in the Features/Tool List on the edit screen.

Use Bilinear Rotation: Bilinear rotation is a higher quality rotation method that produces a higher quality picture then the standard rotation tool. The down side is that it takes more time to process each image using bilinear rotation.

A ***Yes*** answer in the cell activates the Bilinear rotation.

Rotate Destination Box 90 Degrees: Text strings are rotated separately from the "container" or space that they occupy. YES entered here activated the rotation of the "container". If a text string was originally located in a box that measured 20 x 50 pixels, this control will rotate the container 90 degrees, changing the measurement of the box to 50 x 20 pixels.

Added Rotation to Apply (in degrees): The last control rotated the "container", the control rotates the text that resides in the container. This angle is added to whatever angle the rotate tool was going to do based on training and fixturing. The angle entered only effects the contents of the box and not the shape of the containing box itself.

Result Position Absolute Location: Text Entering YES in this control makes the resulting rotated image show at the same screen coordinates every time it is displayed. Yes would be entered when the user wants the resulting image to show up under the original image, or in the upper left hand corner for example.

A NO setting in this box makes the resulting rotated image show up relative to the fixtured original rotate box image location. This is used when you want to move the rotated image to a free area on the image to be inspected.

Train Result Location: Setting this control to YES will add an extra training step which allows the user to place the destination container box on the screen .

A NO setting in this box will instruct the system to train only the source container box and use the numerical offset numbers typed into the parameter page for the offsets (or absolute location).

Result X Location (or offset): Can be used to type in an absolute location on the screen for the result box. Is not particularly useful if "Train result location" is set to "Yes"

Result Y Location (or offset): Can be used to type in an absolute location on the screen for the result box. Is not particularly useful if "Train result location" is set to "Yes" .

Working With the CIVCore Interface

CIVCore Fundamentals

Power Up, Log-In, Select Part, Start-Up, Stop, Log-Out

Objective: Understand and execute basic system functions of the LOMAX vision system.

Reference: CIVCore 9 Quick Start Guide.

Before moving into the more advanced functionality of the LOMAX Inspection system, we should go over the basic Operator-level functionality of the vision system including power-up, logging-in, selecting a part, inspection start-up, stop and logging-out of the system.

Review below steps, the CIVCore User's Manual and the *CIVCore 8.1 User's Reference Manual* to assist you with running and configuring your CIVision Inspection System.

STEP 1 POWER UP THE INSPECTION SYSTEM

Locate the Master Power Switch - *red slotted knob inside a yellow housing*

The master power switch is usually located on the top third of the front or right side of the main enclosure box.

Turn Master Power Switch to On - *turn knob to right - from horizontal to vertical*

To power up the system, the user needs to twist the master power switch to the right so that the handle is running up/down. The word "ON" should be visible on the switch indicator window located in the handle.

Wait for System to Fully Power Up

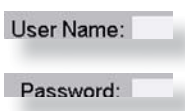
After turning the system on, all required lighting fixtures will turn on, cameras will power- and the touch screen will turn on and display the CIVision logo while Windows initializes itself. If an air line is attached as part of a reject mechanism, there may be a burst of air as the system rejects un-inspected product.

NOTE: *After powering up the system - it could take up to 3 minutes before the system is fully ready to begin inspecting parts.*

STEP 2 LOG-IN TO SYSTEM

Locate and Select the System Login Button - *bottom control bar*

To log into the system, locate and press the Login button (third button from the left) on the bottom control bar. This will open the Change User Level Window.



Enter User Name and Password - *bottom control bar*

Enter your user name and password by tapping once in the User Name text box. A key board will appear in the lower right-hand corner of the screen. Using the keyboard on the touchscreen, enter your user name. Hit the Enter Key (The curser will now move to the password box). Enter your password.

Press LOGIN - *to enter your login information*
Pressing the LOGIN button will enter your information into the system and activate your user profile. You are now ready to begin inspecting.

NOTE: *All inspection systems utilizing CIVCore 7.0 and up have extensive logging capabilities. After a user logs in, the system logs every action the user does.*

STEP 3 SELECTING A PART FOR INSPECTION

Locate and Select the Part Select Button - *bottom control bar*
To select a pre trained part for inspection, locate and press the Parts button (fifth button from the right) on the bottom control bar. This will open the Select Part Window.

Select the Desired Part to Be Inspected - *pre-trained part catalog - left side of screen*
To choose a part to be inspected - find the desired part listed in the part catalog located on the left side of the screen. Tap on the part name to highlight (select) the part and press the load button located in the bottom button menu (top right button).

The select part window will now close - returning the user to the Main screen.

NOTE: *Pressing the Load button will automatically configure the system to take the proper measurements needed to inspect the selected part.*

STEP 4 STARTING THE INSPECTION PROCESS

Locate and Press the Run Button - first button on *bottom control bar*
To start the inspection process, press the green Run button located on the bottom control bar. The Main screen will now change to the Run screen. Live inspection images are being displayed in the Image window (Upper right side of the screen.

The vision system is now actively inspecting the part selected.

STEP 5 STOPPING THE INSPECTION PROCESS

Locate and Press the Stop Button - second button on *bottom control bar*
To stop the inspection process, press the red Stop button located on the bottom control bar.

NOTE: *The inspection process **MUST BE STOPPED** before a new product can be selected or any administrative function can be performed.*

STEP 6 LOGGING OUT OF THE SYSTEM

Locate and Select the System Login Button - *bottom control bar*
To log out of the system, locate and press the Login button (third button from the left) on the bottom control bar. This will open the Change User Level Window.

Locate and Select the Logout Button- *bottom half of the Change User Level Window*
Pressing the Logout button will 1) log the current user out of the system and 2) return the to the default Main screen view.

NOTE: *It is **VERY IMPORTANT** to log out of the system at the end of your shift. If you do not log out of the system, anything done by others will be logged as YOU.*

Notes

Quick Product Change-Over Procedure

Stop, Parts, Pick, Load and Run

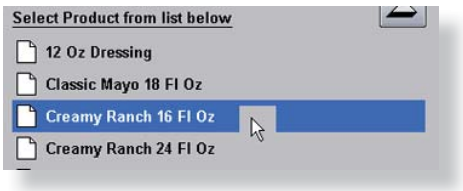
STEP 1 STOPPING THE INSPECTION PROCESS

Locate and Press the Stop Button - first button on *bottom control bar*
To stop the inspection process, press the red Stop button located on the bottom control bar.

NOTE - If you see a green RUN button in the bottom right corner of the bottom control bar - the machine has ALREADY BEEN STOPPED. Please move on to the next step.

STEP 2 SELECTING A PART FOR INSPECTION

Locate and Select the Part Select Button - *bottom control bar*
To select a pre trained part for inspection, locate and press the Parts button (fifth button from the right) on the bottom control bar. This will open the Select Part Window.



Select the Desired Part to Be Inspected - *pre-trained part catalog - left side of screen*
To choose a part to be inspected - find the desired part listed in the part catalog located on the left side of the screen. Tap on the part name to highlight (select) the part.

STEP 3 LOADING SELECTED PART INTO SYSTEM

Load the Selected Part in the System -
Press the load button located in the bottom button menu (top right button). This will load the selected part into the system.

The select part window will now close - returning the user to the Main screen.

NOTE: *Pressing the Load button will automatically configure the system to take the proper measurements needed to inspect the selected part.*

STEP 4 STARTING THE INSPECTION PROCESS

Locate and Press the Run Button - first button on *bottom control bar*
To start the inspection process, press the green Run button located on the bottom control bar. The Main screen will now change to the Run screen.

Adding a New Part to the Parts Library

Using the Copy Part Feature to Create a New Part

Objective: Understand and execute the practice of adding a new part to the Parts Library using the copy part command

Reference: CIVCore 9 User's Reference Manual

The following pages contain step-by-step illustrated instructions on how to add a new part to the vision system's Parts Library using the copy part command.

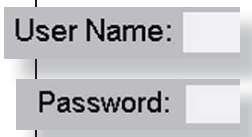
Review the below steps and the ***CIVCore 9 User's Reference Manual*** to assist you with running and configuring your LOMAX Inspection System to inspect the bottles.

Step 1 Be Sure System is not Running

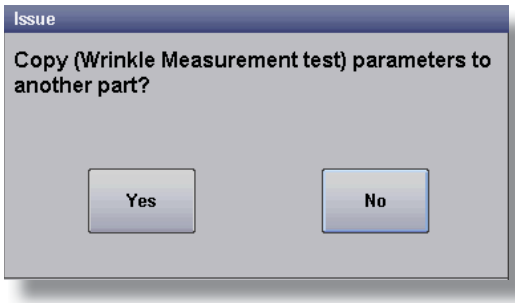
Locate and click the Red STOP button on the Main Menu bar.
The STOP button is main menu bar is found on the bottom of the screen. Clicking this button will turn off the inspection process. If the Run button is showing, the system is already stopped.

STEP 2 LOG-IN TO SYSTEM

Locate and Select the System Login Button - *bottom control bar*
To log into the system, locate and press the Login button (third button from the left) on the bottom control bar. This will open the Change User Level Window.



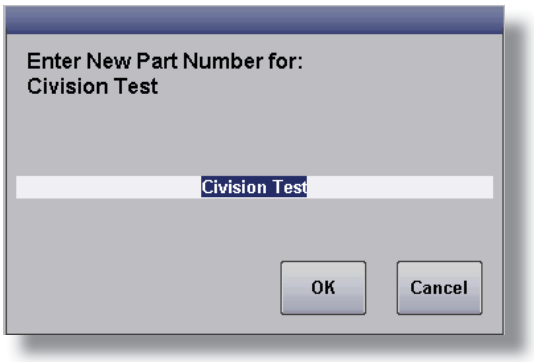
Enter User Name and Password - *bottom control bar*
Enter your user name and password by tapping once in the User Name text box. A key board will appear in the lower right-hand corner of the screen. Using the keyboard on the touchscreen, enter your user name. Hit the Enter Key (The curser will now move to the password box). Enter your password.



Locate and Select the Part to be Copied from the Parts Library
To select, locate the part from the Parts Library *(shown left)* and click (tap) on the name to highlight.

Locate and click the New from Copy button
After selecting and highlighting the part to be copied, click the **New From Copy** button. This will initiate the new part from copy process.

Click the Yes button to Finalize the Process of Creating a New Part
Upon clicking on the Yes button mentioned above, the vision system will copy the tools and parameters from the copied part into a new part in the Parts Library.



Enter Name for New Part Just Created

To enter new part name, tap or touch the text bar in the in the Enter New Part Name window. The touchscreen keyboard will appear. Enter new part name using the keyboard keys and touch OK.

Locate and Select the new part from the Parts Library

To select, locate the part from the Parts Library *(shown left)* and click (tap) on the name to highlight.

Locate and click the Load button

After selecting and highlighting the New Part, click the **Load** button. This will install and initiate all of the copied tools and measurements required to inspect the new part.

Locate and click the Setup button on the Main Menu bar

Clicking the Setup button will take the user the Setup Screens which will give them access to the tools and controls needed to train the New Part

Note: *It is important that the part run through the system to train the system is a "good" part. If a part with errors is used for training the machine, the system will reject normally good bottles and pass only the bottles with the same problems as the bottle used during training.*

System By Pass Mode

Taking System in and out of By Pass Mode

There are times when users may want to put the vision system into "By Pass" Mode - meaning the machine is inspecting but not rejecting any bad product.

Putting System Into By-Pass Mode

Locate the Vision By Pass Switch -Black finger knob labeled Vision
The knob is located on the upper right hand corner of the electrical enclosure door

Turn Vision By Pass Switch to By Pass - *turn knob to right*
The word knob's white indicator should be pointed to the word By Pass.

The system is now in bypass mode - inspecting but not rejecting products.

Taking the System Out of By-Pass Mode - Bring Vision Back On-Line

Locate the Vision By Pass Switch -Black finger knob labeled Vision
The knob is located on the upper right hand corner of the electrical enclosure door

Turn Vision By Pass Switch to On-Line- *turn knob to the left*
The word knob's white indicator should be pointed to the word On-Line.

The system is now back on line and inspecting and rejecting product.

Inspecting Foil Membranes

www.civision.com

LOMAX C- Camera Placement and Functions

Camera Placement and Associated Inspections

Objective: Mastering CIVCore's Inspection Functions and Tools.

Reference: CIVCore 9 User's Reference Manual .

Overview Foil Membrane Inspection System

This 1 Station LOMAX C system utilizes two (2) High Resolution digital cameras. Camera 1 (Top) and camera 2 (Top) are both triggered from the same triggering sensor. The system is designed to inspect foil liners for: (listed by camera):

Camera 1

Camera 1 *Inspects for holes and dents in the can's top foil liner tab.*

Camera 2

Camera 2 *Inspects for can's foil seal position and makes sure seal is formed properly.*

.

CIVCore 9

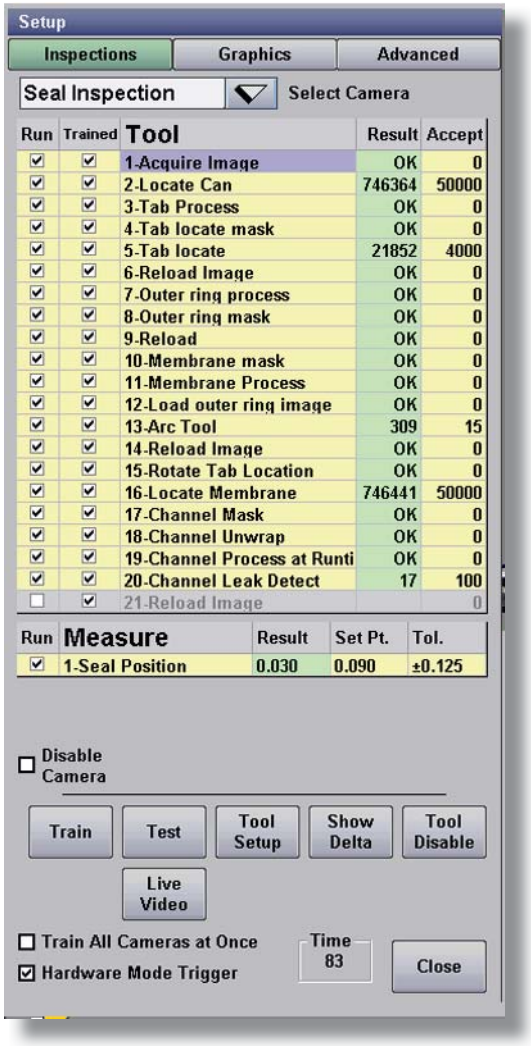
Cameras 1, 2, - Tools and Measures

The LOMAX P inspection system utilizes 2 CCD high resolution monochrome digital cameras to inspect the can's foil liner for defects.

To successfully complete the inspection tasks, the system employs various tools from the CIVCore toolbox. These tools are turned on/off and adjusted in the Set-Up screens of the Lomax P vision system. An example of a set-up screen is provided below.

The vision tools are listed in the Tool window. Double tapping the tool name or clicking on the "Tool Setup" button toward the bottom of the screen will open the tool's parameter screen. This screen is where a qualified user makes adjustments to the tool.

Note: *The illustration below may not look identical to your system Set-Up screen*



Example of a Set-Up Screen

Tools of Camera 1 - Lid Hole & Dent Detect

***The following is a list of the tools utilized by camera 1. This camera is positioned directly above the product as it runs down the conveyor.

Note: *The tools listed are by tool number and in the order they are used by the system while conducting an inspection.*

1) Acquire Image

Acquire Tool- Used by system to acquire an image of the product to be inspected.

2) Locate Search

Blob Tool- This tool locates the can in the field of view (FOV).

3) Tab Process

Process Tool - This tool now process's the image to enhance the tab.

4) Tab Locator Mask

Mask Tool - This tool mask's out everything outside of the tab. This allows us to only find the tab located on the membrane.

5) Tab Locator

Blob Tool - This tool locates the tab inside of the masked area of the membranes.

6) Reload 1

Reload Tool- This tool reloads the original image inspection image to prepare for the next set of inspections

7) Can Top Process 1

Process Tool - This tool is used to mask out the tab from the image.

8) Tab Mask

Mask Tool - We use this tool to mask out everything on the outside of the can.

9) Can Top Mask 1

Mask Tool - ???Placed on the inside edge of the masked area.. Used by the system to look for defects in the center of the cap..

10) Can Top Defect

Blob Tool - This tool is used to look for dents/gouges or holes in the membrane surface.

11) Reload 2

Reload Tool - This tool reloads the original image inspection image to prepare for the next set of inspections.

12) Can Top Process 2

Process Tool - This tool is used to process the top of the can, which is slightly different than the process above. This process is specifically made to find splices.

13) Can Top Mask 2

Mask Tool - This tool is used to search for the presence of splices on the top of the can.

14) Splice Detect

Blob Tool - This tool reloads the original image inspection image to prepare for the next set of inspections .

15) Reload 3

Reload Tool - This tool reloads the original image inspection image back into the system.

Tools of Camera 2 - Seal Inspection Camera

The following is a list of the tools utilized by camera 2. This high resolution camera is also placed at the top of the product while running through the conveyor to view the foil liner of the can to make sure the seal is formed properly.

Note: *The tools listed are by tool number and in the order they are used by the system while conducting an inspection.*

1) Acquire Image
Acquire Tool- Used by system to acquire an image of the product to be inspected.

2) Locate Can
Blob Tool - This tool locates the can in the field of view (FOV).

3) Tab Process
Process Tool - This tool is used to process the image to enhance the tab.

4) Tab Locator Mask
Mask Tool - This tool mask's out everything outside of the tab. This allows us to only find the tab located on the membrane.

5) Tab Locator
Blob Tool - This tool locates the tab inside of the masked area of the membrane.

6) Reload
Reload Tool - This tool reloads the original image inspection image to prepare for the next set of inspections

7) Outer Ring Process
Process Tool - This tool is used to process the image to look for the outer ring of the can.

8) Outer Ring Mask
Mask Tool - We use this tool to mask out everything but the outer ring of the can.

9) Reload
Reload Tool - This tool is used to reload the original image.

10) Membrane Mask
Mask Tool - This tool is used to mask out the outside of the can.

11) Membrane Process
Process Tool - This tool process's the image so the membrane is pure white in the image inspections.

12) Load Outer Ring Image

Reload Tool - This tool is used to take the image created in tool 8 and overlay it on top of the image created from tool 11

13) Arc Tool

Arc Tool - This tool is used to find the outer edge of the membrane and the outer edge of the can. This tool then sends this information to the measurement tool to display it's findings.

14) Reload Image

Reload Tool - This tool reloads the original image inspection image to prepare for the next set of inspections .

15) Rotate Tab Location

Rotate Tool - This tool is used to locate the tab orientation, and rotate the image so the tab appears to be in the same location on the screen regardless of the can orientation during production.

16) Locate Membrane

Blob Tool - This tool is used to relocate the membrane to accurately know its position in the field of view (FOV)

17) Channel Mask

Mask Tool - This tool is used to mask out the outer portion of the can, and most of the inside of the can. The training help notes and images will ensure that proper instruction is done to complete this correctly.

18) Channel Unwrap

Arc Unwrap - This tool takes the image that's left from the mask above and unwraps it into a flat image. Essentially we are taking a label that is round, cutting it, and laying it flat on the image being displayed.

19) Channel Process at Runtime

Process Tool - This tool is used to process the unwrapped image to look for channel leakers.

20) Channel Leak Detect

Edge Tool - This tool is look for channel leakers on the unwrapped image.

21) Reload Image

Reload Tool - This tool is used to reload the original image.

Measure 1

Seal Position This is the tool that make's the actual measurement based on information acquired from the arc tool.

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CIVCore 9

Training System to Inspect Foil Liners

Cameras 1 and 2

Objective: Understand and execute the practice of training the system to inspect foil liners at the end of the manufacturing process.

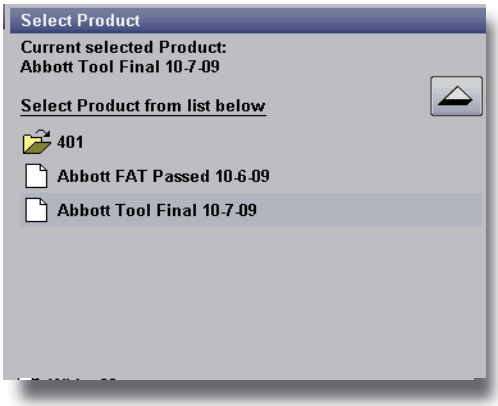
Reference: CIVCore 9 User's Reference Manual

The following pages contain step-by-step illustrated instructions on how to train the vision system to complete inspection of foil liner defects. Less detailed instructions are also available to the user during the product training process via the training help prompts.

Review the below steps and the *CIVCore 9 User's Reference Manual* to assist you with running and configuring your LOMAX Inspection System to inspect the caps.

Step 1 Load the Proper Part into the Inspection System

Locate and click the Parts button on the Main Menu bar.
The main menu bar is found on the bottom of the screen. This will bring the user to the Select Part Library. All pre-trained parts will be visible in the library.



Locate and select proper bottle from the Parts Library
As an example, to select the Abbott Test Final part locate the name Abbott Test Final 10-7-09 in the Parts Library *(shown left)* and click (tap) on the name to highlight.

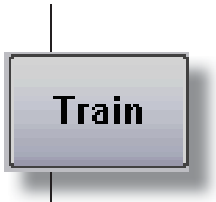
Locate and click the Load button
After selecting and highlighting the desired cap, click the Load button. This will install and initiate all of the pre-installed tools and measurements required to inspect the membrane.

Upon pushing OK, the system will take the user back to the Main screen.

We are now ready to train and inspect the bottle.

Step 2 Train Camera 1

Locate and click the Setup button on the Main Menu bar
Clicking the Setup button will take the user the Setup Screens which will give them access to the tools and controls needed to train the desired bottle.

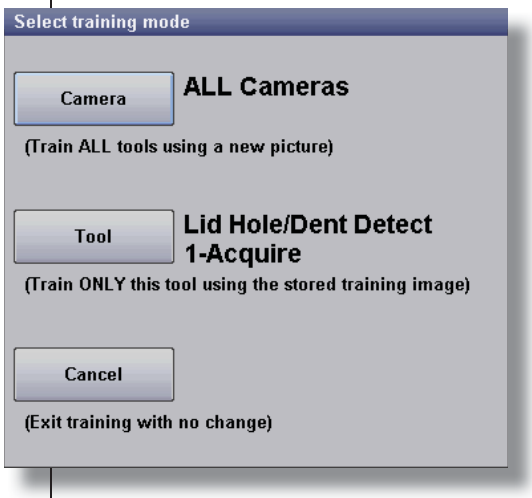


Locate and click the Train button in the lower left corner of the Setup screen
Clicking the train button will begin the training process.

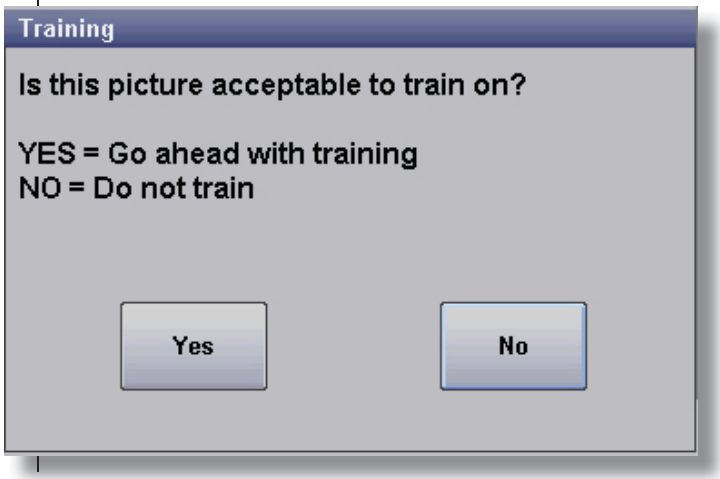
Click the Train All Cameras button in the Select Training Mode
Upon clicking on the Train button mentioned above, the Select Training Mode box will appear. This box allows the user to decide if they want to train all of the tools associated with a camera or train a single tool.

*For this exercise we are going to select **Train All Cameras**.*

The system will next prompt the user to run a can through the system. If the resulting image is good (clear and well focused), we can begin training the first camera.



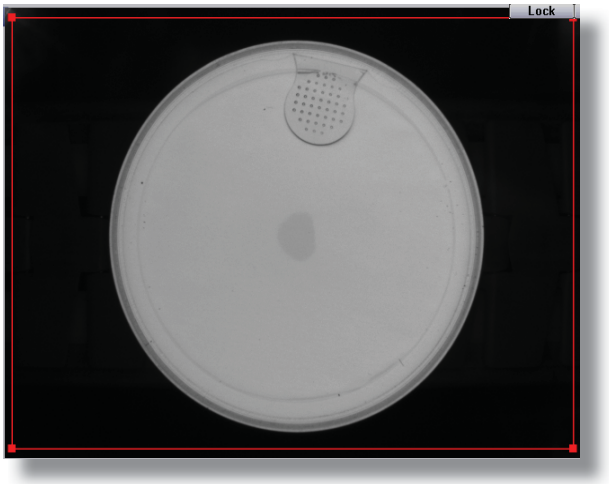
Note: *It is important that the cap run through the system is a good bottle. If a cap with errors is used for training the machine, the system will reject normally good caps and pass only the caps with the same problems as the cap used during training.*



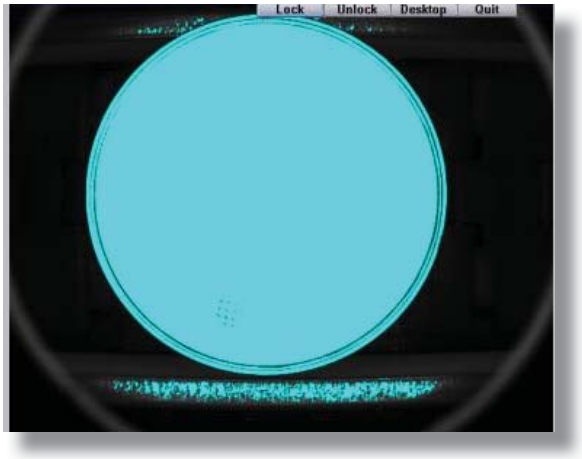
Training Cam 1- Acquire Image

Place the 2 Locator - Place the red box of the Locator tool around the entire top of the can, including as much of the black space surrounding the can as possible.

When finished, the image should look like that on the right.

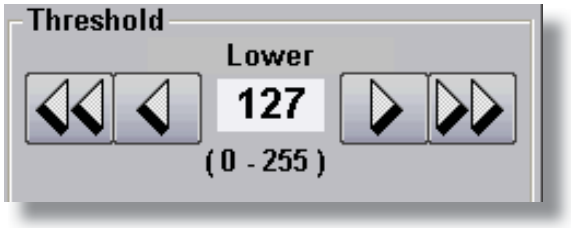


Training Cam 1 - 2 Locator - Thresholding

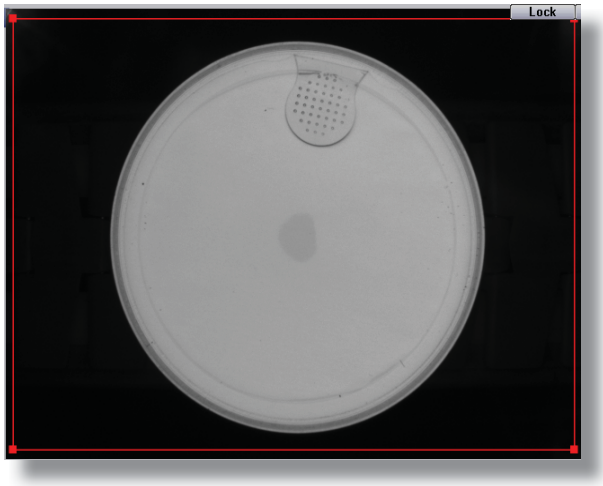


Adjust the threshold up or down so that the entire can is covered in cyan.

Picture should resemble the image on left.



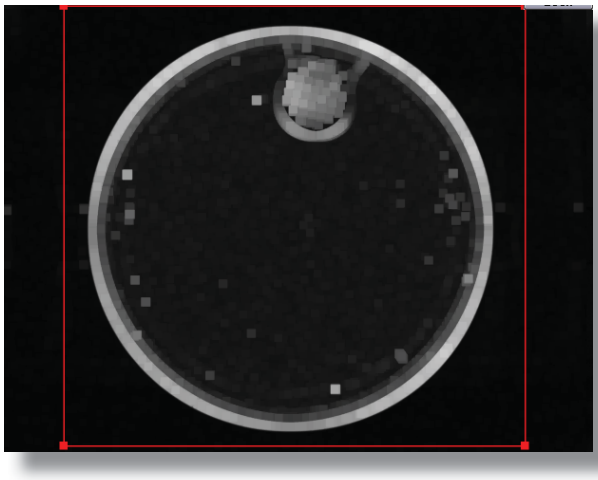
Training 3 - Tab Process



Place 3 - Tab Process - Place the red box of the Process tool around the entire top of the can, including as much of the black space surrounding the can as possible.

When finished, the image should look like that on the left.

Training 4 - Tab Locator Mask



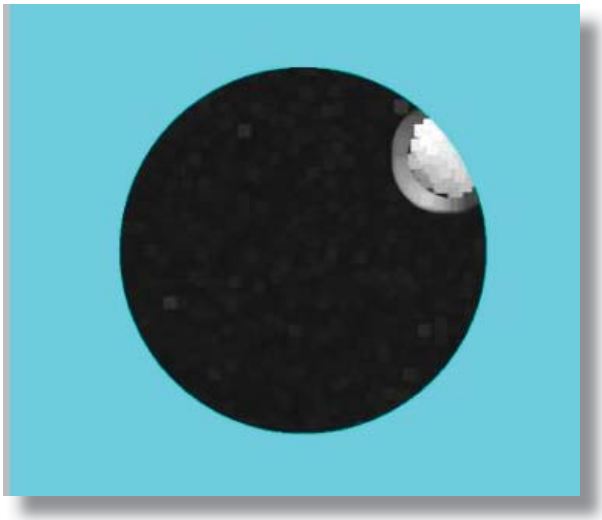
Place 4 - Tab Locator Mask - Place the red box of the Locator mask tool around the entire top of the can, including as much of the black space surrounding the can as possible.

When finished, the image should look like that on the left.

Training 4b - Tab Locator Mask

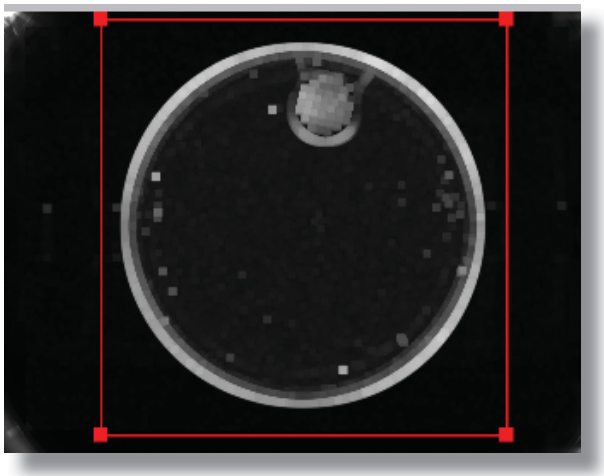
An outline of the inside of the can will need to be drawn. This will instruct the system to ignore everything in the picture except the inside of the can's membrane.

Be sure to pay special attention to the steps given in the step by step part training guide included in vision system.

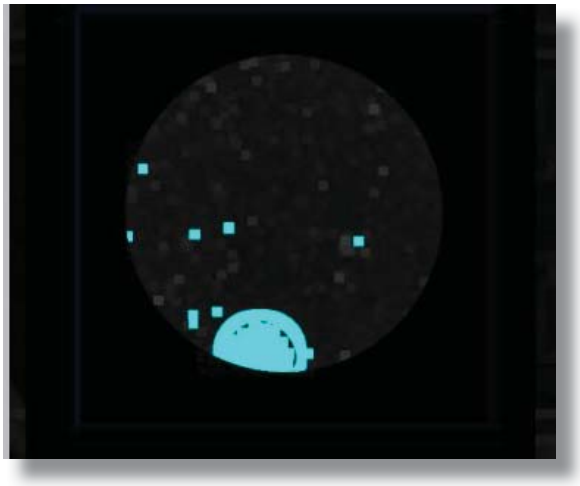


Training 5 - Tab Locator

Place tool 3 - Tab Locator - Place the red box of the Locator tool around the entire top of the can, including as much of the black space surrounding the can as possible..

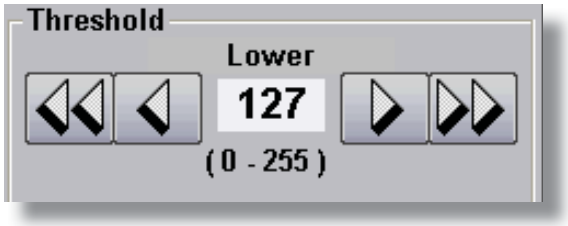


Training 5 - Tab Locator - Thresholding

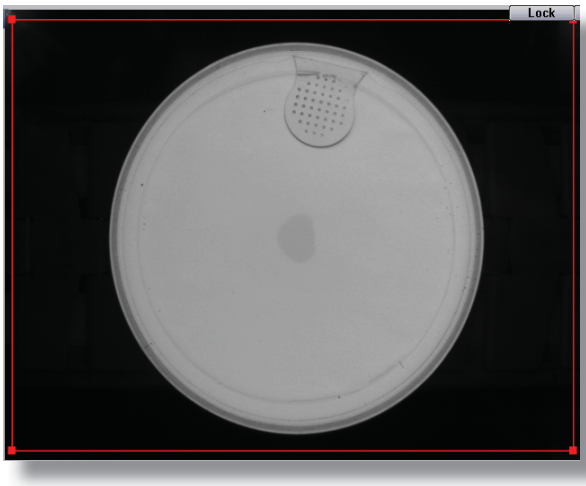


Adjust the threshold up or down so that the entire TAB is covered in cyan.

Picture should resemble the image on left.



Training 7 - Can Top Process 1



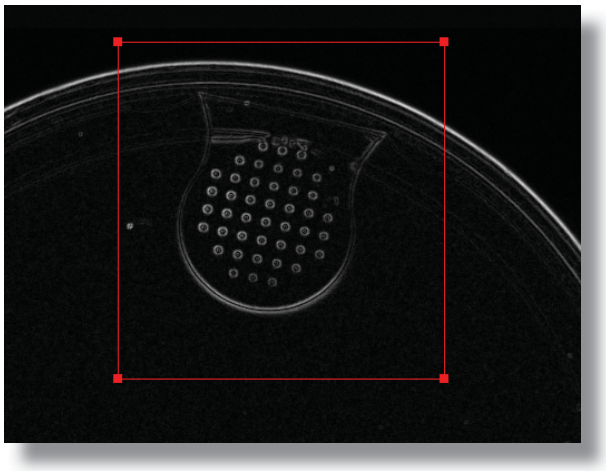
Place 7 - Tab Process - Place the red box of the Process tool around the entire top of the can, including as much of the black space surrounding the can as possible.

When finished, the image should look like that on the left.

8 - Tab Mask

Place the red box of the Tab Mask Tool around the entire tab of the lid.

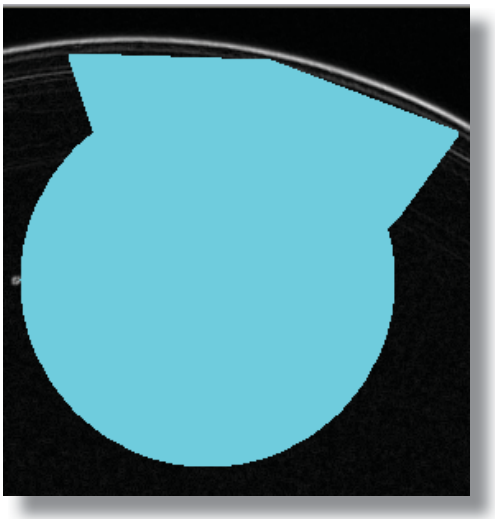
When completed, the picture should resemble the image to right.



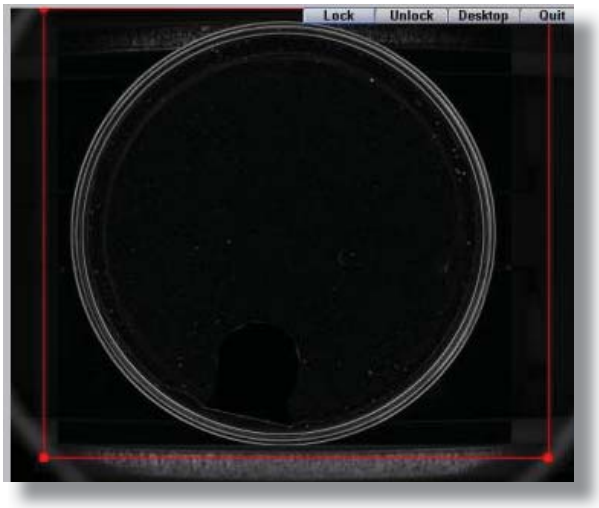
Training 8b - Tab Mask Threshold

An outline of the inside of the tab will need to be drawn. This will instruct the system to ignore everything in the picture except the tab itself.

Be sure to pay special attention to the steps given in the step by step part training guide included in vision system.



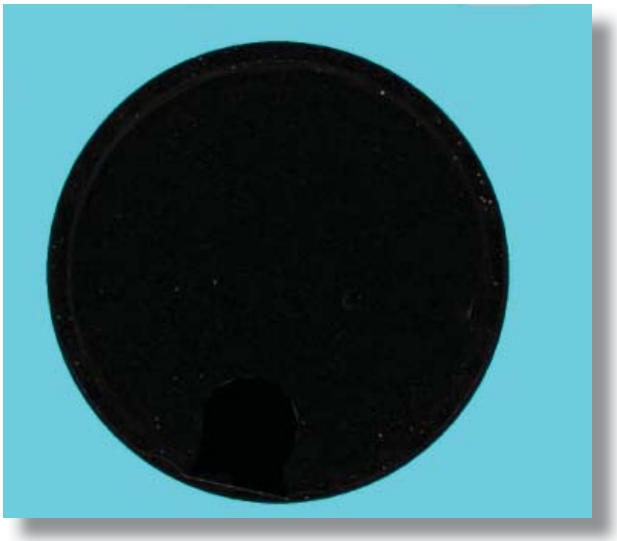
Training 9 - Can Top Mask 1



Place 9 - Can Top Mask 1 - Place the red box of the Mask tool around the entire top of the can, including as much of the black space surrounding the can as possible.

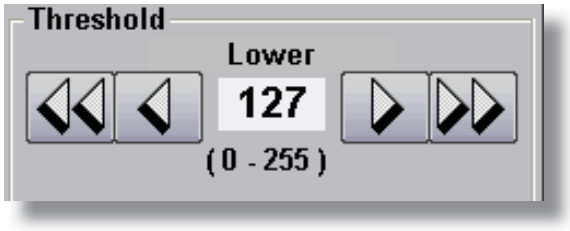
When finished, the image should look like that on the left.

Training 9b - Can Top Mask 1 Threshold



An outline of the inside of the can will need to be drawn. This will instruct the system to ignore everything in the picture except the can itself.

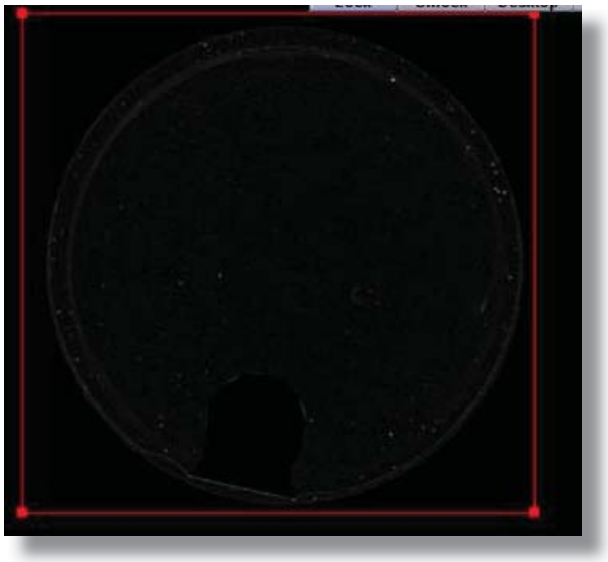
Be sure to pay special attention to the steps given in the step by step part training guide included in vision system.



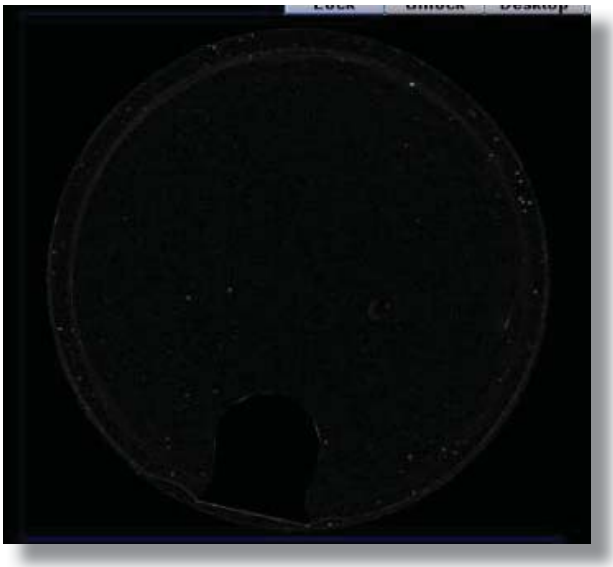
Training 10 - Can Top Defect

Place the Can Top Defect tool's red box around the entire top of the can -including sufficient white space around the can as well.

When finished, the image should look like that on the right.

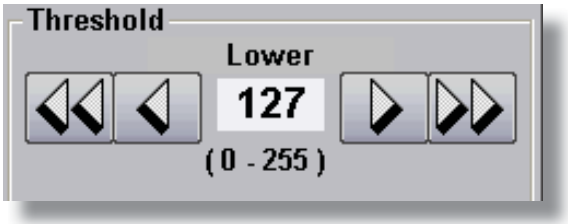


Training 10b - Can Top Defect Threshold



Adjust the threshold up or down until there are no cyan dots on the top of the can.

When finished, the image should look like that on the right.

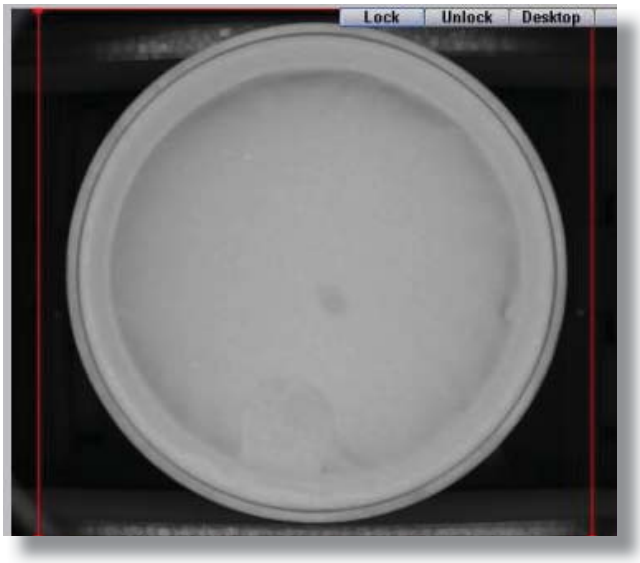


Training 12 - Can Top Process 2

Place 12 - Can Top Process 2 - Place the red box of the Process tool around the entire top of the can, including as much of the black space surrounding the can as possible.

When finished, the image should look like that on the left.

Training 13 - Can Top Mask 2



Place 12 - Can Top Process 2 - Place the red box of the Process tool around the entire top of the can, including as much of the black space surrounding the can as possible.

When finished, the image should look like that on the left.

Training 13b - Can Top Mask 2 Threshold

An outline of the inside of the can will need to be drawn. This will instruct the system to ignore everything in the picture except the can itself.

Be sure to pay special attention to the steps given in the step by step part training guide included in vision system.

Training Cam 14 - Splice Detect

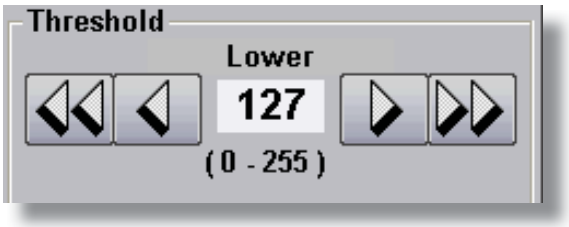
Place the red box of the Splice Detect Tool around the entire top of the can, ensuring that there is adequate white (black) space on all sides of the square.

When finished, the picture should like the one on the left.

Training 14b - Splice Detect Threshold

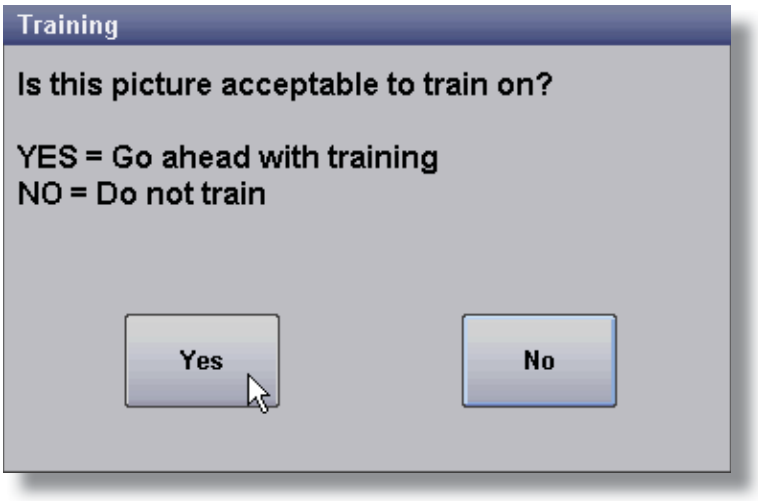
Adjust the threshold up or down until there are no more cyan dots on the top of the can. Should look like the image on left.

NOTE: If this is a can with a splice, adjust the threshold until only the splice is covered in cyan dots.

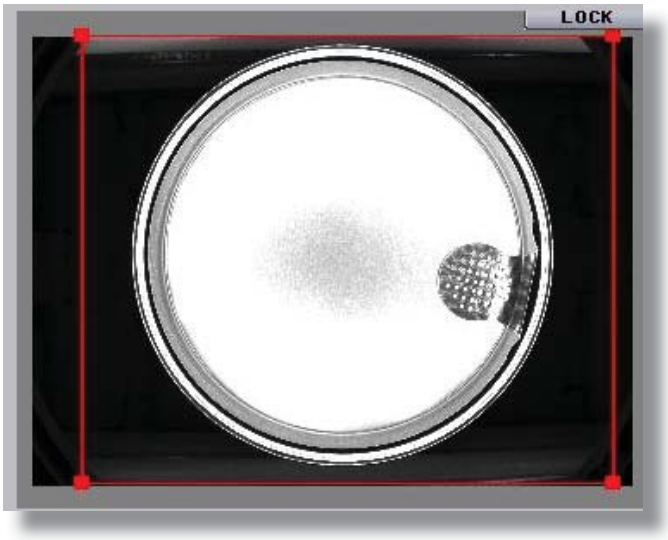


Step 3 Train Camera 2

You have completed training Camera 1 and the system automatically moved to Camera 2. This warning box will appear asking if the image is acceptable.



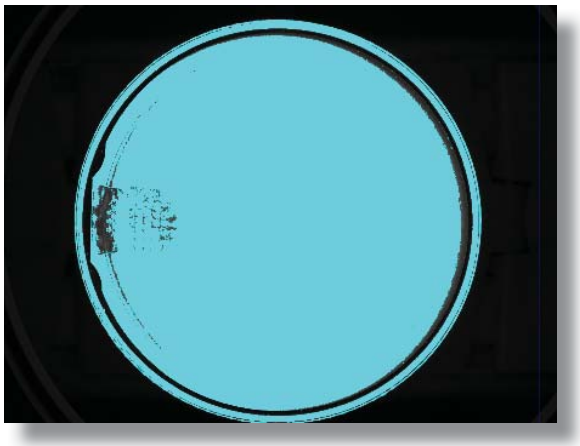
Training 2- Can Locate Camera



Place the red box of Can Locate tool around the entire top of the can, ensuring that there is adequate white (black) space on all sides of the square.

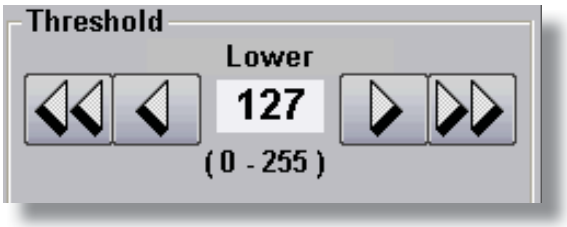
When finished, the picture should like the one on the left.

Training Cam 2 - 2 Locator - Thresholding

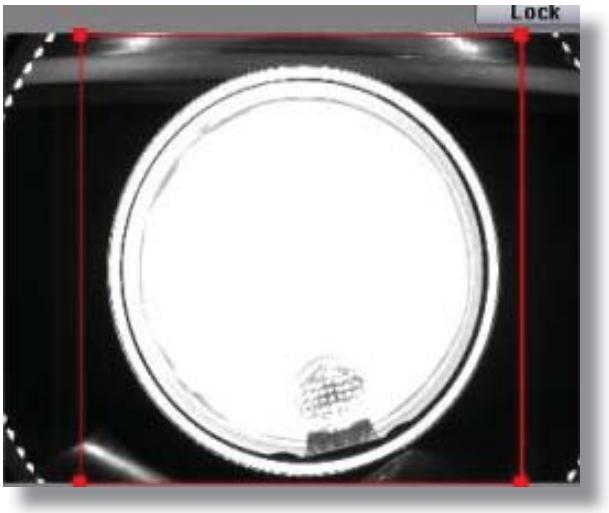


Adjust the threshold up or down so that the entire can is covered in cyan.

Picture should resemble the image on left.



Training 3 - Tab Process



Place 3 - Tab Process - Place the red box of the Process tool around the entire top of the can, including as much of the black space surrounding the can as possible.

When finished, the image should look like that on the left.

Training 4 - Tab Locator Mask

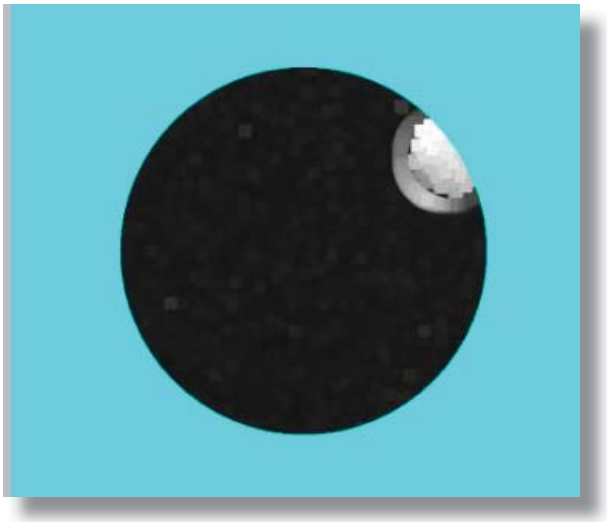
Place 4 - Tab Locator Mask - Place the red box of the Locator mask tool around the entire top of the can, including as much of the black space surrounding the can as possible.

When finished, the image should look like that on the left.

Training 4b - Tab Locator Mask

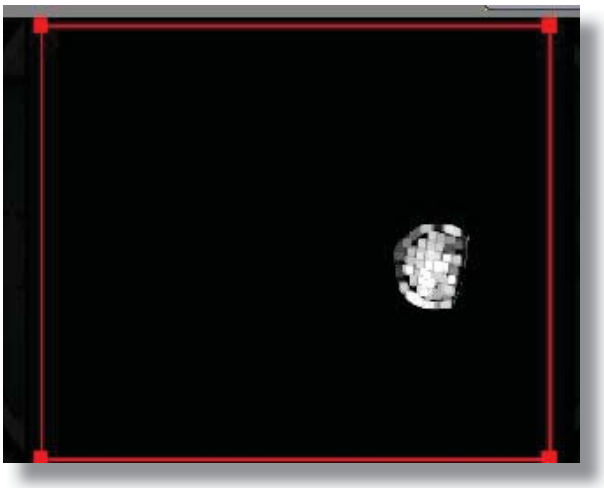
An outline of the inside of the can will need to be drawn. This will instruct the system to ignore everything in the picture except the inside of the can's membrane.

Be sure to pay special attention to the steps given in the step by step part training guide included in vision system.

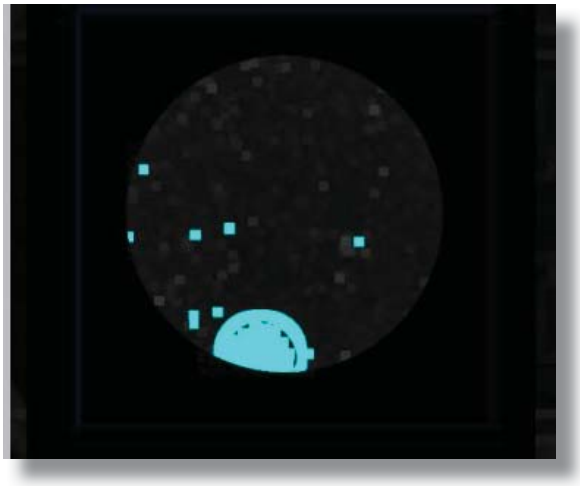


Training 5 - Tab Locator

Place tool 3 - Tab Locator - Place the red box of the Locator tool around the entire top of the can, including as much of the black space surrounding the can as possible..

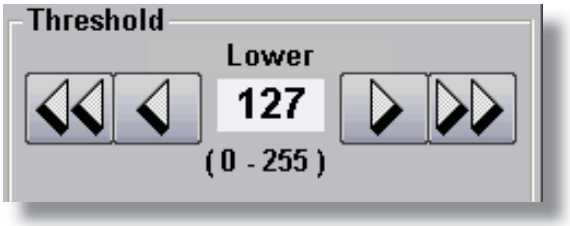


Training 5 - Tab Locator - Thresholding

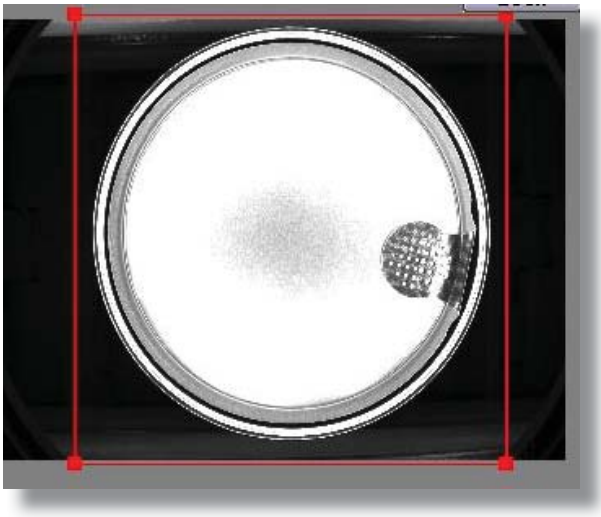


Adjust the threshold up or down so that the entire TAB is covered in cyan.

Picture should resemble the image on left.



Training 7 - Outer Ring Process



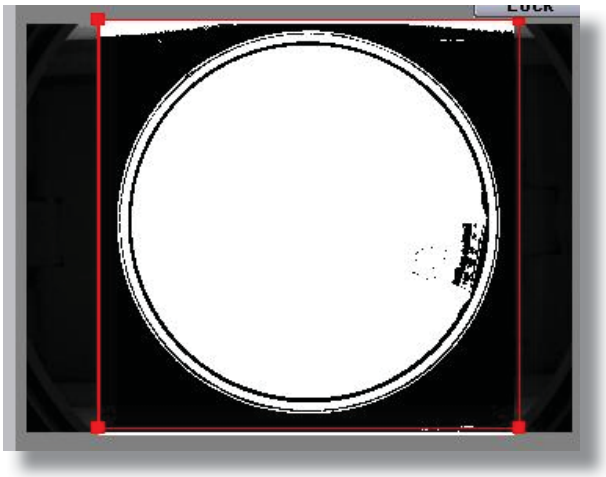
Place 7 - Outer Ring Process - Place the red box of the Process tool around the entire top of the can, including as much of the black space surrounding the can as possible.

When finished, the image should look like that on the left.

8 - Outer Ring Mask

Place the red box of the Tab Mask Tool around the entire tab of the lid.

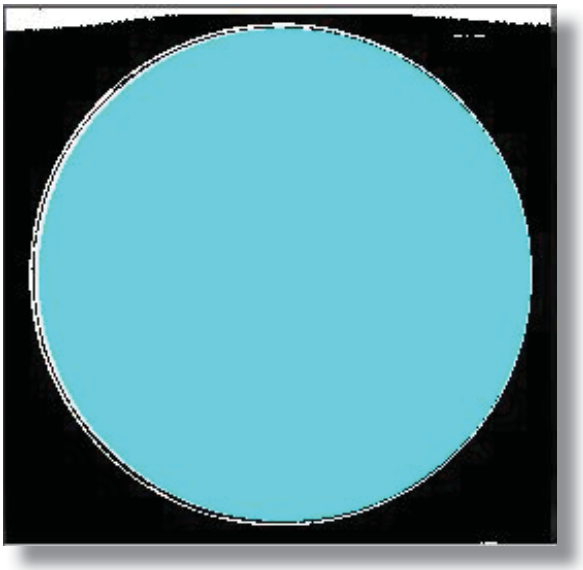
When completed, the picture should resemble the image to right.



Training 8b - Outer Ring Mask Threshold

An inner mask will need to be drawn. This will instruct the system to ignore everything in the picture except the tab itself.

Be sure to pay special attention to the steps given in the step by step part training guide included in vision system.



Training 10 - Membrane Mask 1

Place 10 - Membrane Mask - Place the red box of the Mask tool around the entire top of the can, including as much of the grey area surrounding the can as possible.

When finished, the image should look like that below.

Training 10b - Can Top Mask 1 Threshold

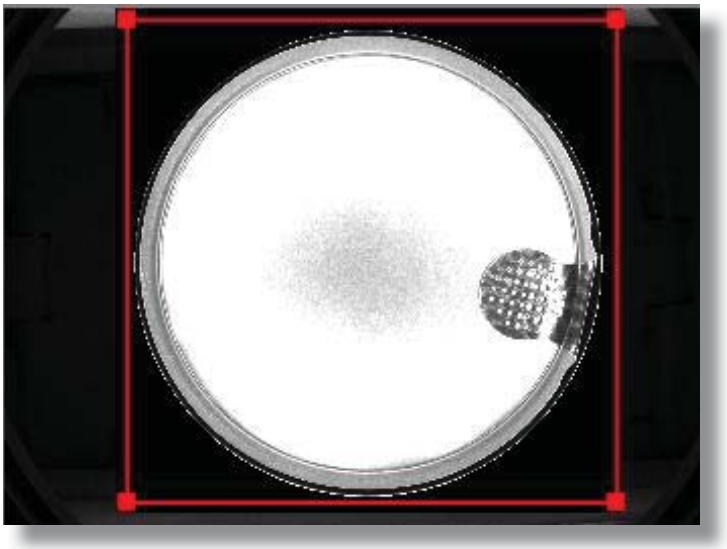
Ensure that the entire grey area on the screen to the right is masked out.

Be sure to pay special attention to the steps given in the step by step part training guide included in vision system.

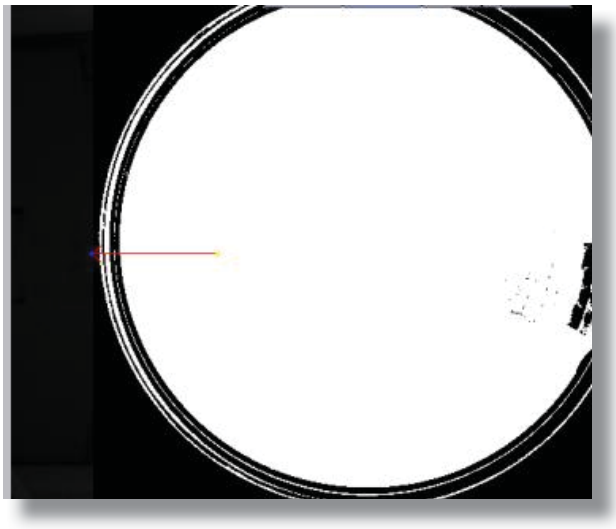
Training 11 - Membrane Process

Place the Membrane Process tool's red box around the entire top of the can -including sufficient white space around the can as well.

When finished, the image should look like that on the right.



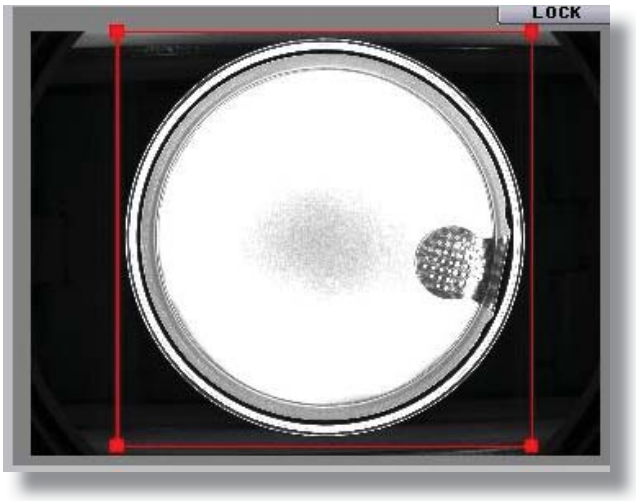
Training 13 - Arc Tool



Place the arrow, going from right to left, starting on the inside of the can at the 9:00 position on the top of the lid.

Picture should resemble that on the left..

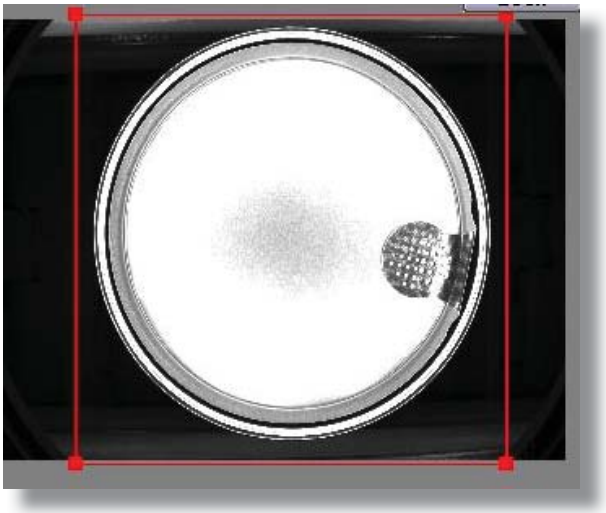
Training 15 - Rotate Tab Location



Place the red box around the entire top of the can, including black space around the can.

Picture should resemble the image on left.

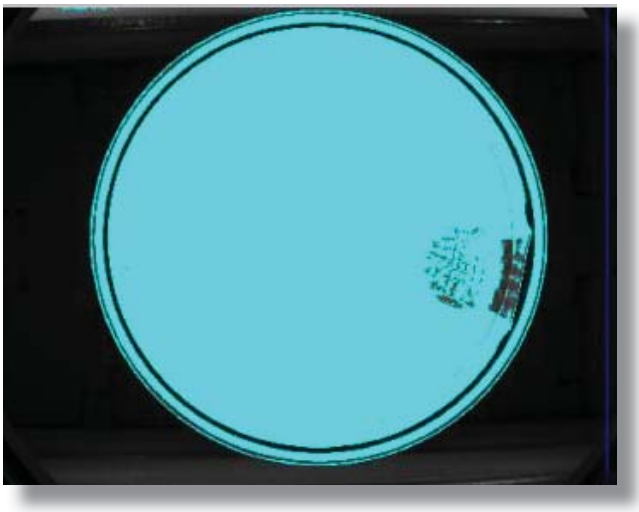
Training 16 - Locate Membrane



Place the red box around the entire top of the can, including black space around the can.

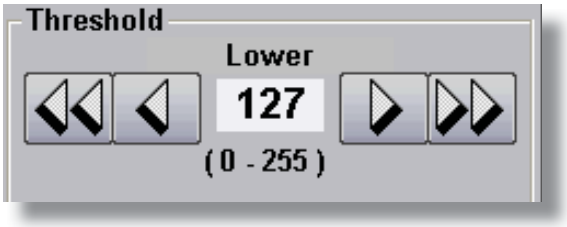
When finished, the image should look like that on the left.

Training 16b - Tab Locator - Thresholding

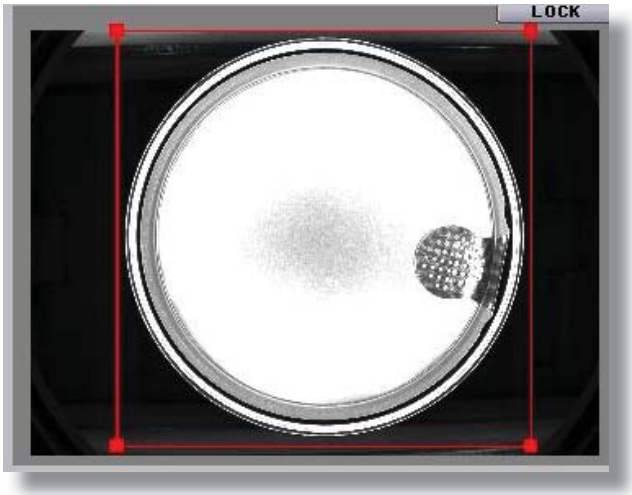


Adjust the threshold up or down so that the entire top of the can is covered in cyan.

Picture should resemble the image on left.



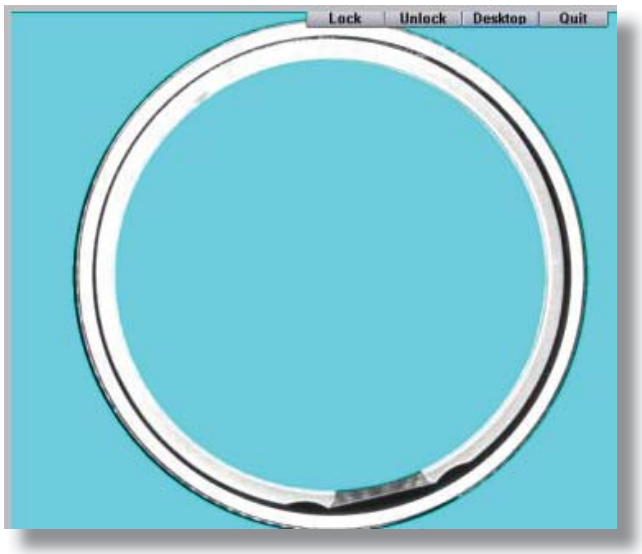
Training 17 - Channel Mask



Place the red box around the entire top of the can, including black space around the can.

Picture should resemble the image on left.

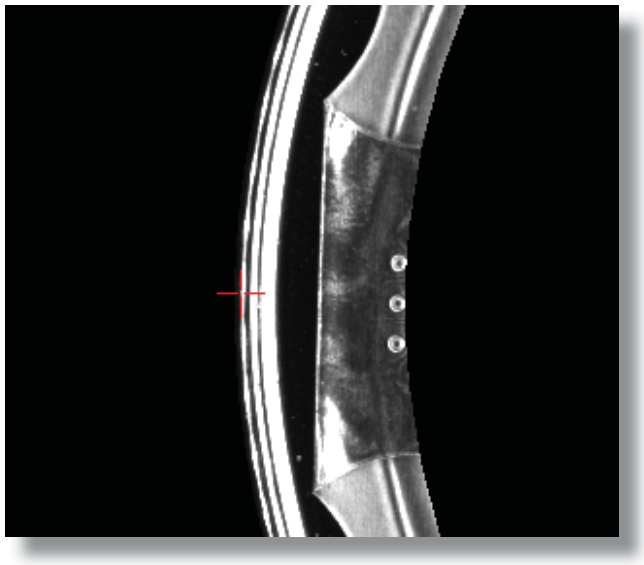
Training 17B - Channel Mask



An inner and outer mask of the can will need to be drawn.

Be sure to pay special attention to the steps given in the step by step part training guide included in vision system.

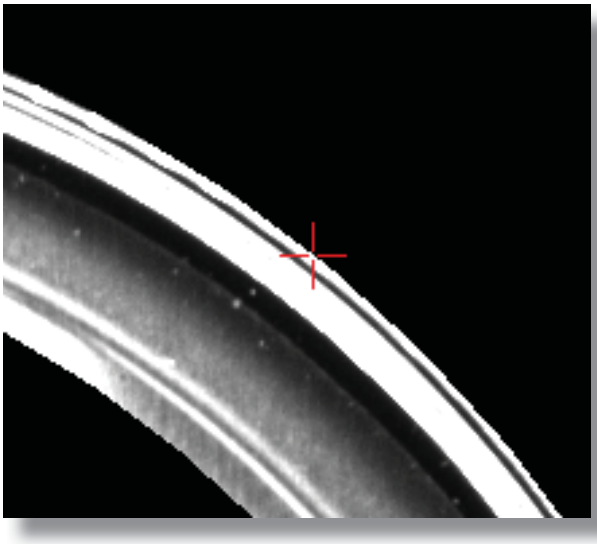
Training Sealing Inspection First Point



Place first cross hairs by the center of the tab.

When finished, the image should look like that on the left.

Training Sealing Inspection Second Point



Place the second cross hair about 120 degrees from the 1st placement area.

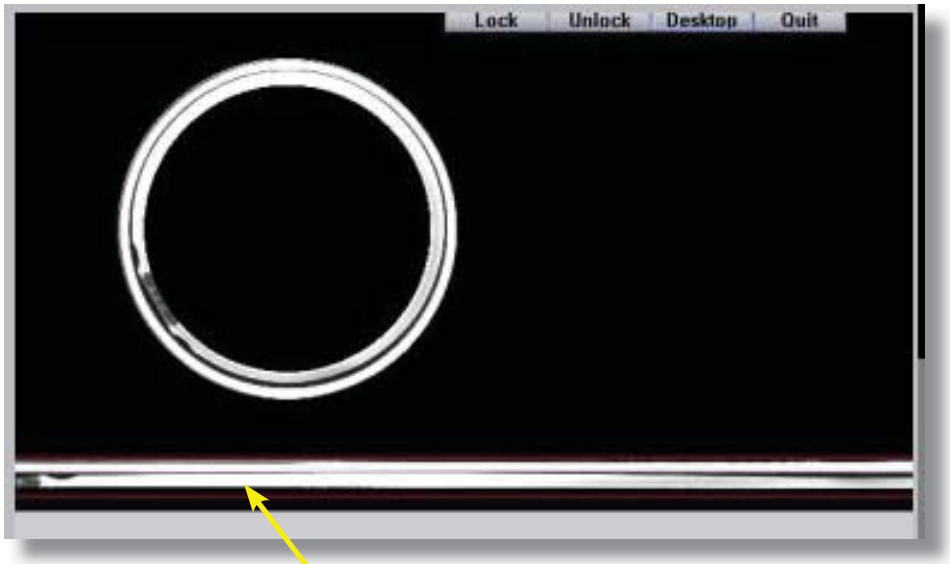
When finished, the image should like that on the left.

Training Sealing Inspection Third Point

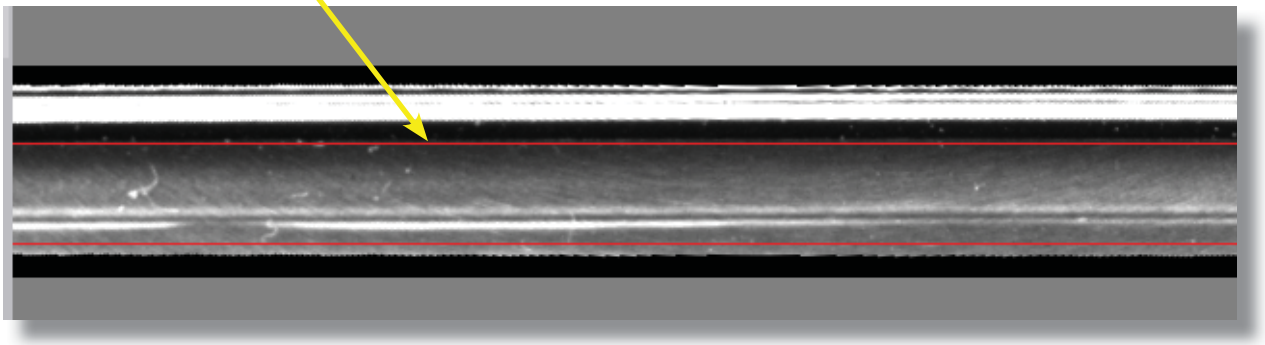
Place the third cross hair about 120 degrees from the 2nd placement area.

When finished, the image should like that on the left.

Training 19 - Channel Process at Runtime



Place the red box over the unwrapped image of the container.

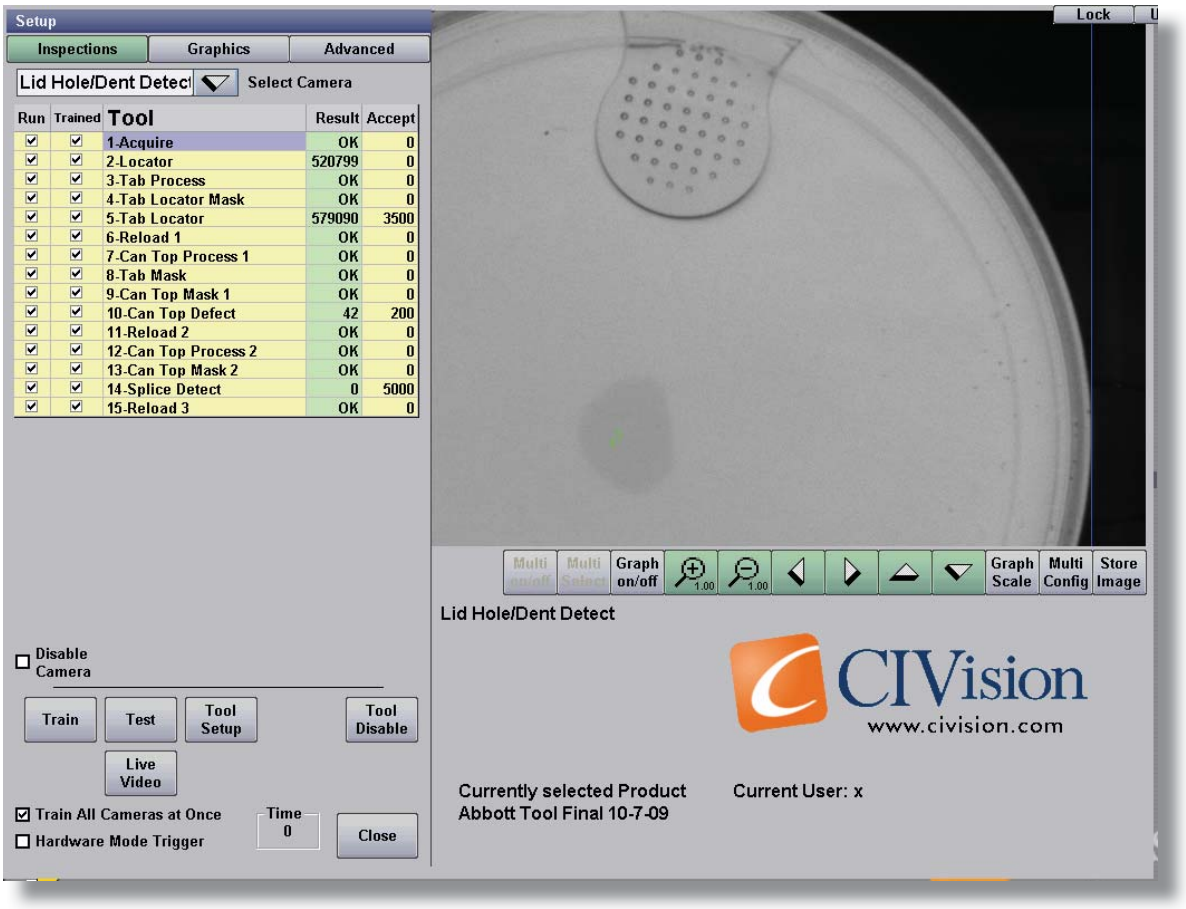


Training 20 - Channel Leak Detect

Place and Size the edge too on the processed portion of the unwrapped image..

We have completed the part training process.

The system will go back to displaying the Set-Up Setup Screen.



Press the test button to check your work. If you any of the tools failed, you should go back and train just that tool.

To adjust or retrain a faulty tool parameter:

1. Highlight the tool that needs adjusting by touching it in tool list shown above.
2. Touch the Train button.
3. Retrain the tool.

4) Touch Test Again.

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Maintenance and Troubleshooting

Maintenance Schedule

Conveyor

Maintenance to perform	Interval
Replace brushes on main conveyor motor.	Every 3000 hours of run time at full speed
Inspect conveyor side belt for defects and wear. Replace belt when necessary.	Weekly
Inspect side conveyor belt speed. Adjust as needed.	Weekly
Replace brushes on side conveyor motor.	Every 6000 hours of run time at full speed

Cameras & Lenses

Maintenance to perform	Interval
Inspect camera lenses for dirt and dust. Clean lenses as needed.	Weekly
Confirm camera lens thumb screws are tight. Tighten as needed.	Weekly
Confirm lens is tightly attached to camera. Tighten as needed.	Weekly

Pneumatic Systems

Maintenance to perform	Interval
Check setting on pressure regulator. Adjust as needed.	Weekly
Check pneumatic dryer accumulator for fluid. Drain as needed.	Weekly
Check air lines for leaks. Replace or repair as needed.	Weekly
Make sure in-feed air supply is clean and free of debris.	Weekly

Software

Maintenance to perform	Interval
Check CIVCore software fault log. Clean lenses as needed.	Weekly
Back up CIVision directory.	Weekly

Air Conditioning

Maintenance to perform	Interval
Inspect infeed air filter under the top cover for the air conditioning unit.	Monthly
Replace infeed air filter.	Yearly, or when the filter can no longer be cleaned.
Check the thermostat setting.	Monthly
Check main enclosure temperature. Condensation will form if the enclosure is too cold. The computer will overheat if the enclosure is too hot.	Monthly

Stack Light & Alarm

Maintenance to perform	Interval
Inspect light bulbs and alarm. Replace as needed.	Monthly

Fan

Maintenance to perform	Interval
Inspect fan motor.	Monthly
Inspect fan filter.	Biweekly

Stack Light Signals

The inspection system utilizes a three color stack light to notify staff in the general area about it operating status. The various light signals and their meaning are listed below:

Light Color and Pattern	Meaning
Green Light - steadily lit..	System Running - everything is well
Green Light - flashing on and off.	S in BY-PASS mode
Red Light - flashing on and off	System or PLC Fault -- Check
Amber Light Flashing	Reject chute is Full
No Light	System is not inspecting

PC and PLC Faults

Fault Name	Corresponding Event	Corrective Action
Anti-Circumvention - Encoder Defeated during run	Customer system run input is enabled but encoder count is not incrimenting	Verify system run input is operating properly. Ensure encoder is properly attached to conveyor. Inspect encoder cable, wiring, and encoder operation.
Anti-Circumvention-Run input defeated-Encoder moving	Customer system run input is not enabled but the encoder count is incrimenting.	Verify system run input is operating properly. Ensure encoder is mounted to the proper conveyor. Ensure conveyor stops when run input is not enabled. Ensure proper encoder operation.
Anti-Circumvention-Run input defeated - Trigger occurred	Customer system run input is not enabled but the vision received a trigger input.	Verify system run input is operating properly. Ensure trigger sensor is not being triggered falsely.
Anti-Circumvention - Trigger defeated during Run	Customer system run input is enabled and vision system did not receive a trigger within the allotted time.	Verify system run input is operating properly. Anti-Circumvention check - Time between triggers allowed in ms in PLC configuration not set properly, increase time.
Authorization (Wibu) Key is Missing	The Wibu Key has been removed from the USB slot on the back of the PC.	Make sure the Wibu Key is securely plugged into a USB slot on the PC Make sure that the USB port is active and working properly through Windows Device Manager
Automatic Logout	Automatically created when a user has been logged out by CIVCore.	No correction action needed.
Bypass Enabled Too Long	The bypass time out setting is enabled and the bypass check box in the software (not in the physical switch on the enclosure) has been checked for more than the configured amount of time.	Uncheck "Disable Rejecting" in the Advanced tab of the Setup screen.
Camera Lost	The software has received an image from some but not all of the cameras in a trigger set.	Make sure all of the trigger cables (RJ45 connectors on the back of the cameras) are securely plugged into all the cameras.

Fault Name	Corresponding Event	Corrective Action
Camera Lost - Acquisition Returned	The Acquisition dll has lost the data from one of the cameras.	Make sure all of the rj45 cables are securely plugged into the back of the computer and the back of the camera.
Comm Error	The serial communication between the PC and the PLC is corrupted.	Make sure the serial cable is securely connected to both the PC and the PLC.
Encoder Not Functioning	The PLC tracking queue is configured to track the parts based on encoder pulses and two trigger inputs have occurred without the encoder count incrimenting.	Make sure the rotary object that the encoder is attached to is moving. Make sure the encoder is securely mounted and rotating in sync with the rotary object that it is attached to. Make sure the encoder cable is securely fastened to the encoder and none of the wires on the termination end are loose.
Failure Report Generated	Save Failure Report button was pressed in the statistics Screen	No correction action needed
FIFO Sensor Missing Part	The PLC has a part in the tracking queue that has reached the end of the queue without receiving a response from the FIFO sensor.	Verify FIFO sensor operation. Check cabling. Make sure that the length of the queue is long enough to enable the part to reach the FIFO sensor before the queue times out.
License Key Missing	The MIL License Key has been removed from the USB slot on the back of the PC.	Make sure the MIL license Dongle is securely plugged into a USB slot on the PC Make sure that the USB port is active and working properly through Windows Device Manager
PC -> PLC Count Match Error	Communication error between PC and PLC.	Check cable between PC and PLC, Ensure that the serial COM port assigned at C;\CIVision\ Global Settings\System Setup. txt is active and working properly as seen through Windows Device Manager.
PC -> PLC Data Out of Range	Data entered in during PLC configuration is out of range	Ensure PLC data is with-in range.

Fault Name	Corresponding Event	Corrective Action
PLC Serial Communications Fault	The PLC code that initializes the serial communication between the PC and the PLC is not running properly.	Ensure that the serial COM port assigned at C:\CIVision\Global Settings\System Setup.txt is active and working properly as seen through Windows Device Manager.
PLC Serial Link Failure	The connection between the PC and the PLC is not present.	Make sure the PLC cable is securely plugged into both the PLC and the specified COM port on the back of the computer. Required COM port can be found at C:\CIVision\Global Settings\System Setup.txt
Queue Fault	There are more than 120 parts between the trigger photo eye and the reject location.	Move the rejector closer to the point of inspection
Queue Lock Failure	Internal running error	Call CIVision Technical Support
Reject Did Not Verify	The PLC sent a reject output and did not receive a reject verify input within the user-defined time.	Make sure the reject verify photo eye and photo eye reflector are aligned. Make sure the rejected bottle's trajectory breaks the beam of the reject verify photo eye. Make sure the "Reject verify time" is long enough to allow for the bottles movement from the point of reject to the reject verify photo eye
Reject Verify Sensor Fault	The reject sensor input has been active for longer than a user-specified time.	Make sure there are no foreign objects or bottles blocking the beam of the reject verify photo eye. Make sure the "reject blocked time" is long enough to allow normal photo eye blockage caused by the bottle's movement off the conveyor.
Result Count Match Error	Communication error between PC and PLC	Check cable between PC and PLC, Ensure that the serial COM port assigned at C;\CIVision\Global Settings\System Setup.txt is active and working properly as seen through Windows Device Manager.

Fault Name	Corresponding Event	Corrective Action
Tool not trained	An untrained tool has been enabled while in Run Mode	No correction action needed
Trigger Sensor Fault	The trigger sensor input has been active for more than the user-defined amount time.	Make sure there are no foreign objects or bottles blocking the beam of the trigger photo eye. Make sure the "Trigger blocked time" is long enough to allow normal photo eye blockage caused by the bottles movement thru the vision system.
Vision Fell Behind	The PLC has more than 10 parts in its tracking queue that have not received a response from the PC.	Make sure the total inspection time displayed on the main run screen is not continually longer then the time between bottles.
Vision No Response	The PLC has a part in the tracking queue that has reached the reject point without receiving a response from the PC software.	Make sure that the your "Length of 'A' Queue" for the corresponding trigger is not less then your overall inspection times displayed on the main run screen.
Vision Response Without Trigger	The PLC has received a response from the PC software and the PLC does not have a matching part in its queue.	Make sure all trigger cables are as far away from any AC power lines as possible. Make sure all camera trigger terminals (refer to electrical schematics for terminal numbers) are tight and none of the wires are loose.
Warning - User CRC Invalid - Disabled	The text file used to store the user account information has been modified in some way outside of the software.	Restore an older backup of the CIVision directory, or re-create the disabled user through the software.

Startup Sequence and Related Faults

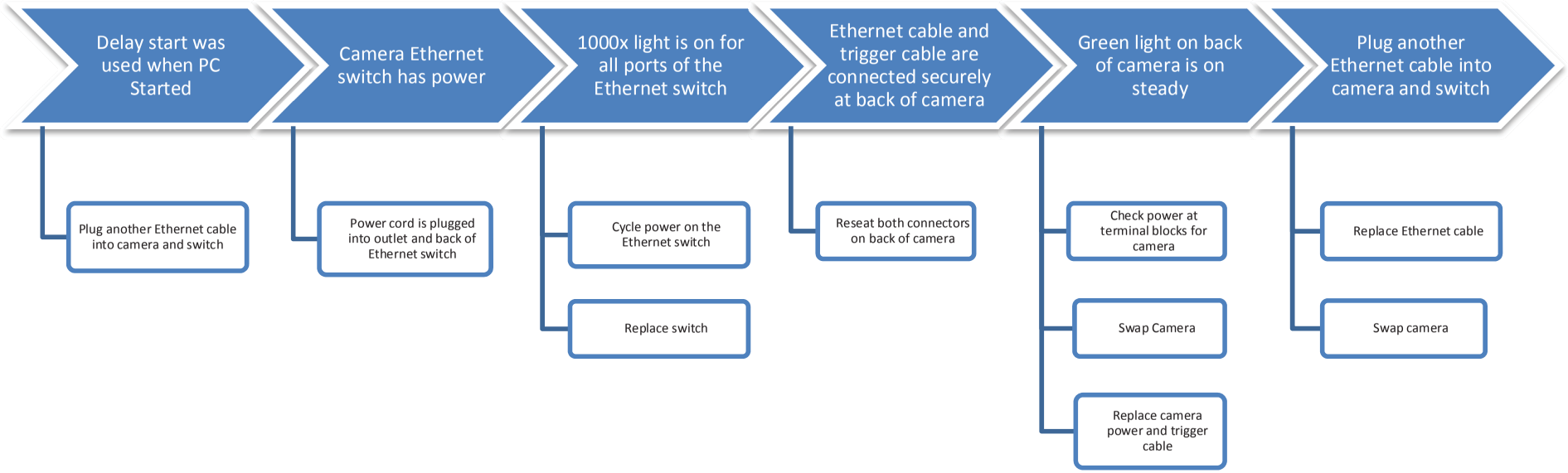
The events outlined below occur in that order once the power switch is turned to the "ON" position. Errors that may occur at each step during the startup process can be corrected as outlined below.

Proper Machine Action	Possible Problems and Corrective Actions
Fan or Air Conditioner turns on	Fan or A/C does not turn on Check power at the terminal block. Check power at the fuse block. Check for blown fuses. Check for bad wires or termination.
AC-powered lights turn on	AC-powered lights don't turn on Check that the lights are plugged in. Check power at the terminal block. Check power at the fuse block. Check for blown fuses. Check for bad wires or termination.
Uninterruptible Power Supply (UPS) powers up	UPS does not power up Press the ON switch on the UPS. Check power at the receptacle. Check power at the fuse block. Check for blown fuses. Check for bad wires or termination.
PLC powers up	PLC does not power up Check power at the terminal block Check power at the fuse block. Check for blown fuses. Check for bad wires or termination.
DC-powered lights turn on	DC-powered lights don't turn on Check that the lights are plugged in. Check power at the terminal block. Check power at the fuse block. Check for blown fuses. Check for bad wires or termination.
Green stack light turns on	Green light is FLASHING The bypass switch is set to "Bypass." Green light is OFF The PC is uploading new parameters to the PLC. The green light will come on when CIVCore is in Run mode. All output lights are OFF and PLC run light is OFF The PLC does not have a program.
Red stack light is off	Red light is FLASHING: The PC or the PLC has faulted. Correct the fault. Guidelines for correcting faults are under the "PC and PLC Faults" section of this manual. Red light is ON Check the Input/Output (I/O) configuration for multiple outputs assigned to the red light's I/O word. Check for incorrect wiring. All output lights are OFF and PLC run light is OFF The PLC does not have a program.

Correct Machine Response	Possible Problems and Corrective Actions
PC starts up	PC does not start up Check the PC's power switch. Check power at the receptacle. Check power at the fuse block. Check for blown fuses. Check for bad wires or termination. Verify that the cards in the PC are properly seated.
CIVCore starts	CIVCore does not start 1. Create a shortcut to CIVCore in the Startup folder. 2. Use the CIVCore icon to start CIVCore. User receives "Software Not Authorized" error Verify that the WIBU key is plugged in. Verify that the correct version of CIVCore is running. Verify the network card's MAC address. Re-seat the network card.
If all the above events occur and all errors are corrected, CIVCore will now start in Run mode.	

CIVCore Won't Start Due To Camera Issues

Answer Yes Move Right, Answer No - Move Down


Delay start was used when PC Started
Camera Ethernet switch has power
1000x light is on for all ports of the Ethernet switch
Ethernet cable and trigger cable are connected securely at back of camera
Green light on back of camera is on steady
Plug another Ethernet cable into camera and switch
Plug another Ethernet cable into camera and switch
Power cord is plugged into outlet and back of Ethernet switch
Cycle power on the Ethernet switch
Replace switch
Reseat both connectors on back of camera
Check power at terminal blocks for camera
Swap Camera
Replace camera power and trigger cable
Replace Ethernet cable
Swap camera

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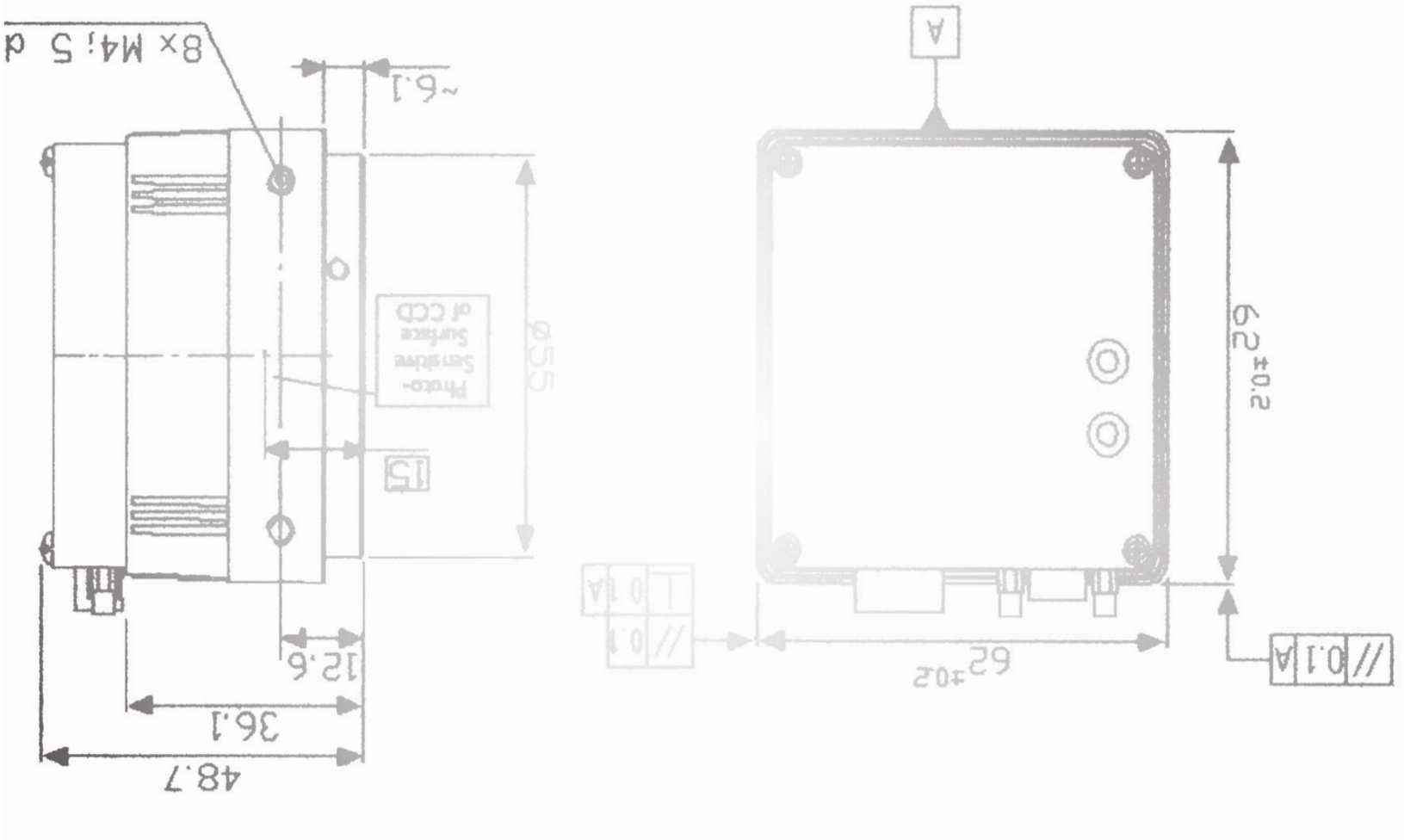


Administrator Functions Overview

CIVCore 9

About the Administrator Functions Screens

The **Administrator Functions screens** and their sub screens allow the system administrators access to the advanced features of the software. These advanced features are used by the administrative users of the vision system to make changes to the general functionality and the behavior of the system. Examples of the types of changes that can be made are:

- Modify permissions and passwords for individual users
- Modify permissions for groups of users
- Adjust settings that control the functionality of the parts tracking and rejecting
- Set up statistics parameters
- Calibrate the cameras

The Administrative functions are divided into, displayed in and accessed from three sections of the Main Administrator Screen. These sections are labeled: **Debugging**, **System** and **Setup**.

The permissions level of the logged in user dictates the functionality they will have inside this section. The following section of this book is an overview of the Administrative functions referenced throughout the CIVCore® Vision System.

The following pages contain screen shots, illustrations and detailed descriptions of the various Administrative Screens, their sub-screens and the functionality of all these screens.

The Administrative screens used in the CIVCore® Vision Engine interface include:

- The Camera Hardware Setup screen
- The Digital I/O screen
- The System Parameters screen
- The Camera Calibration screen
- The User Accounts screen
- The User Permissions screen
- The System Security screen
- The Statistics Parameters screen
- The Statistics Configuration screen
- The PLC Configuration screen

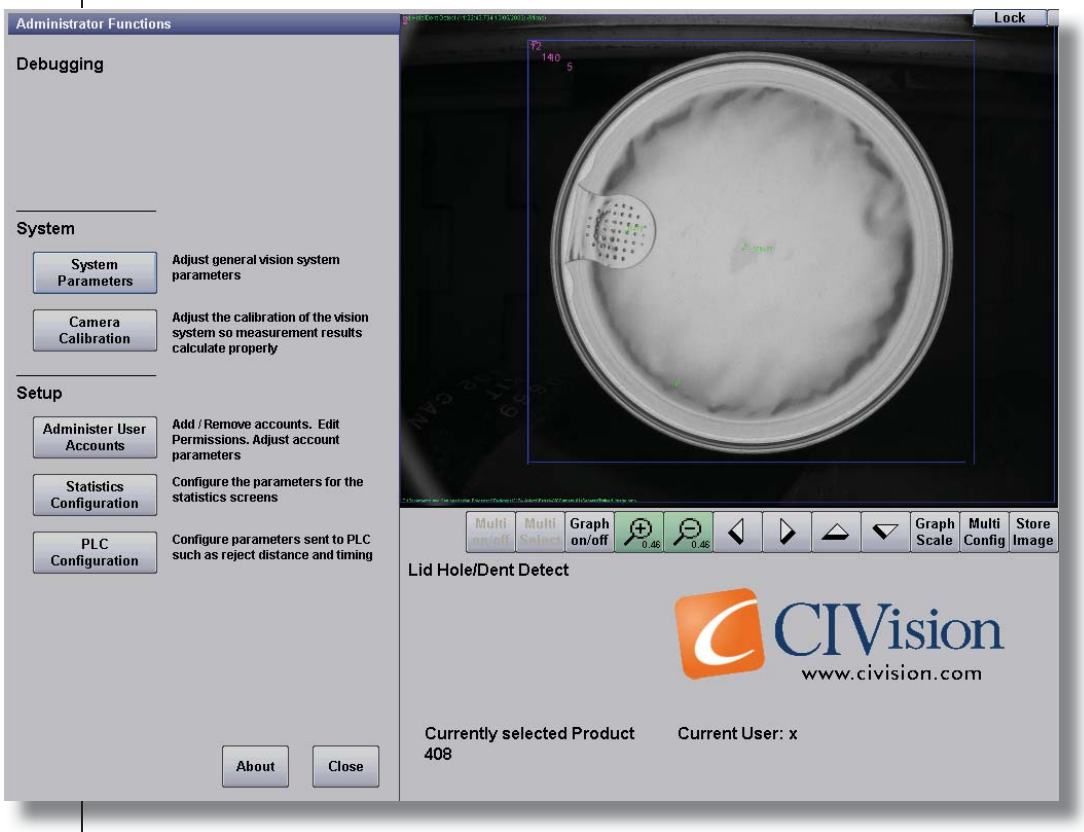
Note: *The Administrator screens are presented in their natural progression as a user navigates through the screens.*

Depending on a user's permissions, not all User Screens will be available to all users. If you can't get access to screens you think you may need, please contact your vision system administrator.

Administrative Functions Screen

To users with the proper permissions, the **Admin** button is available on the **Main** screen. The Administrator Functions screen is where advanced features of the software are located. These advanced features are used by the administrative users to make changes to the general functionality and the behavior of the system. These functions are organized into three (3) categories: **Debugging, System, and Setup**.

The following section will give the user a solid understanding of the functionality of all the administrative controls in the system.



Left: The Administrator - Main screen.

The Administrator - Main screen serves as a portal to all of the advanced controls of the system.

Administrator - Main screen Controls and Functionality:

The Administrator - Main screen is divided into three sections: Debug, System and Setup. These sections offer the following functions and buttons.

Debug Section

The Debug section of the Administrator Functions Screen contains tools to help monitor the system, debug any system setting that's not quite right and detect any problems in the CIVCore software. The two major functions under this section are: Camera Hardware Setup and Digital I/O.

Camera Hardware Setup: Displays the Camera Hardware screen. This screen allows the user to change which physical camera is attached to the logical camera used in the CIVCore software. *Read more about this function on page 130.*

Digital I/O button: Displays the Digital I/O window. The Digital I/O window allows the user to verify that the inputs and outputs to the system are operating correctly.

System Section

The System section of the Administrator Functions Screen contains tools to make functional system changes, adjustments to the cameras, and provide access to most of CIVCore's logs. The three major functions under this section are: System Parameters and Camera Calibration.

System Parameters button: Displays the System Parameters screen. This screen is used to change passwords and other system parameters. *Read more about this function on page ###*

Camera Calibration button: Displays the Camera Calibration screen. This tool allows the user to adjust camera views from "pixel" coordinates to "Real World" coordinates. *Read more about this function on page ###.*

Setup Section

The Setup section of the Administrator Functions Screen contains tools to make functional system changes such as user accounts and permissions and what the system tracks statistically and how these statistics are displayed. The two major functions under this section are: Administer User Accounts and Statistics configuration.

Administer User Accounts: Opens the User Accounts screen. This is where user accounts are added and eliminated, and permissions levels are changed. *Read more about this function on page ###.*

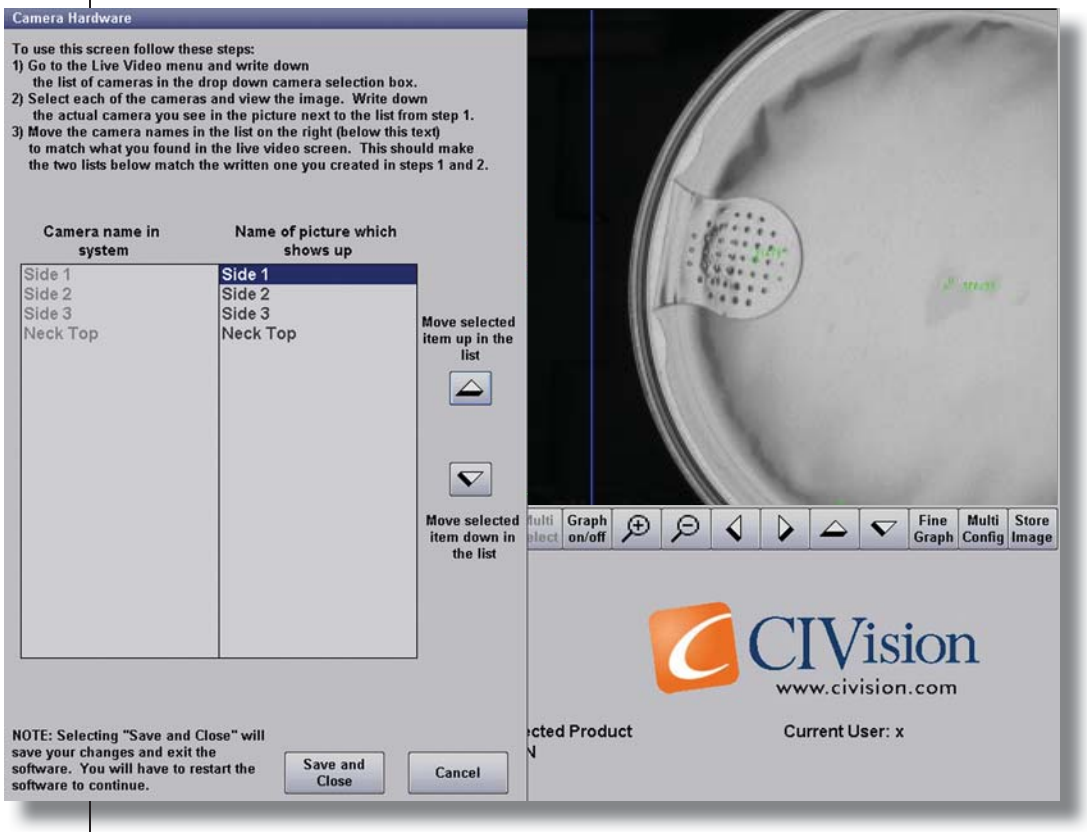
Statistics Configuration: Opens the Statistics configuration screen. This is where the user chooses which statistics to display and manipulates how the system displays these statistics. *Read more about this function on page ###.*

About button: Displays a dialogue box containing information regarding the system software. *Read more about this function on page ###.*

Close button: Closes the Administrator Functions window and return the user to **Main screen**.

Admin - Camera Hardware Screen

This menu allows you to change which physical camera is attached to the logical camera used in the CIVCore software. This can be used if you have replaced several cameras at the same time and the auto camera detect feature of CIVCore has placed the cameras in the wrong order, which would show up as the wrong camera views in Live Video.


Camera Hardware
To use this screen follow these steps:
1) Go to the Live Video menu and write down the list of cameras in the drop down camera selection box.
2) Select each of the cameras and view the image. Write down the actual camera you see in the picture next to the list from step 1.
3) Move the camera names in the list on the right (below this text) to match what you found in the live video screen. This should make the two lists below match the written one you created in steps 1 and 2.
Camera name in system
Name of picture which shows up
Side 1
Side 2
Side 3
Neck Top
Side 1
Side 2
Side 3
Neck Top
Move selected item up in the list
Move selected item down in the list
Graph on/off
Fine Graph
Multi Config
Store Image
CIVision
www.civision.com
Current User: x
NOTE: Selecting "Save and Close" will save your changes and exit the software. You will have to restart the software to continue.
Save and Close
Cancel

Left: The Administrator - Camera Hardware screen.

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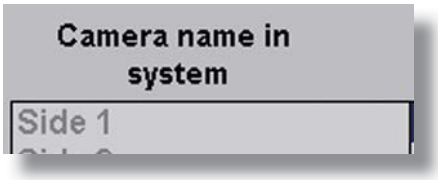
Administrator - Camera Hardware Screen Controls and Functionality:

The Administrator - Camera Hardware screen offers the following functions and buttons.

To get started utilizing this screen, the user needs to first build a list of cameras in the vision system. ***This is done via the Global Settings directory located in the main CIVCore folder on the C:drive.*** *(This list shows up in the camera drop down selection boxes seen in many places while using the software.)* The cameras in the drop down boxes will appear is the same order as they are on the left side of this screen.



After creating the above mentioned camera list, the user should then go into the **Live Video screen** and select the first camera in the dropdown list and write down next to it what camera view is displayed in the video window. Repeat this process for all of the cameras found in the pulldown menu.

After noting all of the views from all of the cameras, the user must now make the list on right side of the **Camera Hardware** menu match what was observed in the Live Video screen. This is accomplished by selecting a camera on the right side of the list that is in the wrong spot and using the **move up** and **move**

down buttons to the right of the list to move the camera to the proper place in the list.

Once this is complete in this menu, the user should press **Save and Close** to make the changes. The software will shutdown and restart to complete the changes. If done correctly, the camera views as seen in the Live Video screen should match the cameras in the drop down camera selection boxes.

Move Selected Item Up ...: Allows the user to move the selected camera view **up** to match the proper camera name. One click equals one move up.

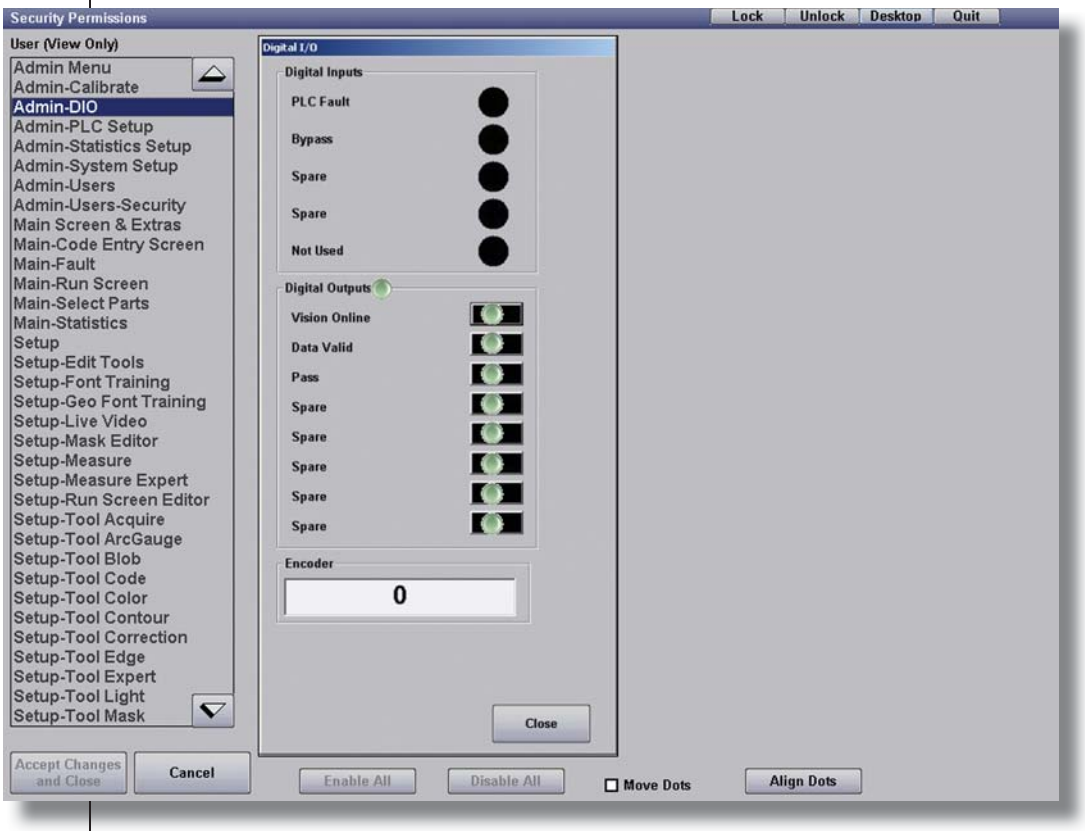
Move Selected Item Down...: Allows the user to move the selected camera view **down** to match the proper camera name. One click equals one move down.

Save and Close button: Allows the user to save the changes made and close down CIVCore. Changes made will not take effect until the software has been restarted. Click on the **CIVCore.exe logo** located on the systems desktop to restart the software.

Cancel button: Cancels any changes made, exit the Camera Hardware screen and return the user to the Administrator Functions window.

Admin - Digital I/O Screen

When the user clicks on the Digital I/O button located on the Administrator Functions Panel, the Digital I/O window is displayed as shown below. The Digital I/O window allows the user to verify that the inputs and outputs to the system are operating correctly.



Left: The Administrator - Digital I /O screen.

The Digital I/O window allows the user to verify that the system's inputs and outputs are operating correctly.

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Administrator Digital I/O Screen Controls and Functionality:

The Administrator - Digital I/O screen offers the following functions.

Testing Inputs

To test the digital inputs, a green light will appear next to the input that is triggered. If there is no indication that the input was triggered the wiring should be verified. When the device is enabled the box color will change to green and when the device is disabled the box color will be black.

The text next to the light indicator describes the basic functionality of the I/O point. The user can turn the output point on and off by simply clicking on the indicator light.

If more details about the I/O screen are needed, please refer to the **system's electrical drawings** included on the reference disc included with your inspection system.

Encoder (1 -6): Depending on the number of encoders utilized in the system, these text boxes will display a number between 0 and 30,000. This number is the tracking number of the part currently being displayed in the video window.

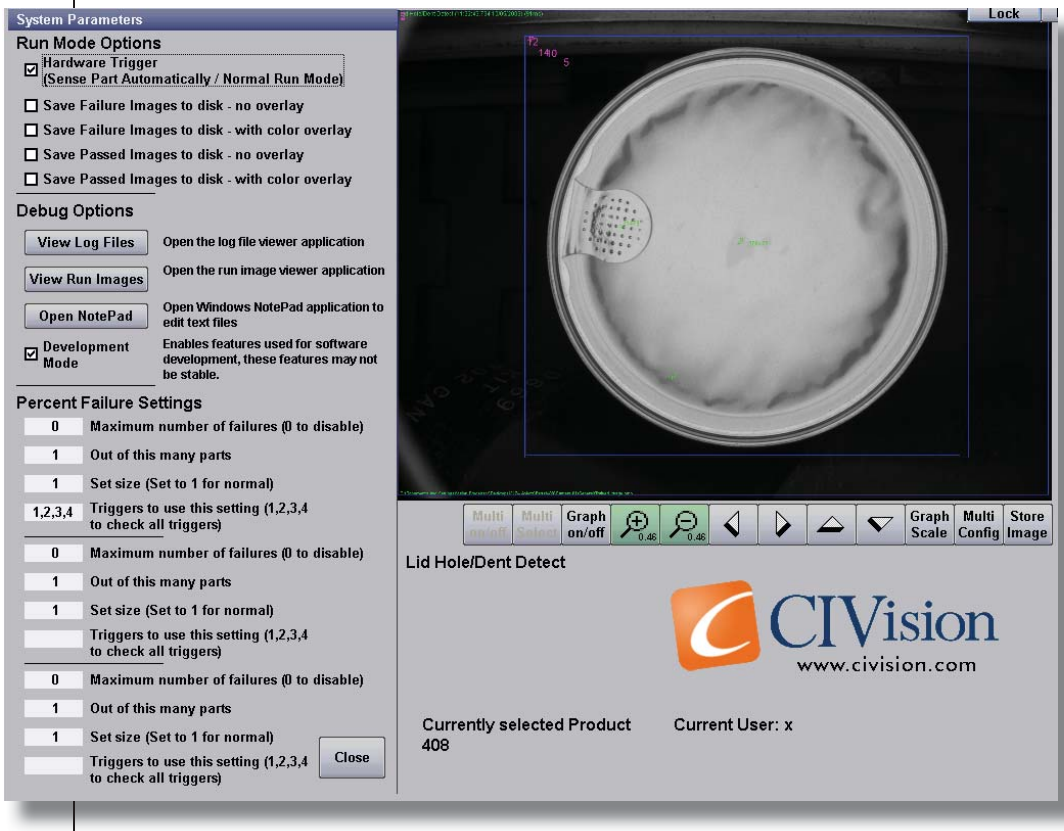
Note: *These encoder boxes will appear even if your system doesn't utilize encoders.*

PLC Revision: If applicable, this box displays the current version of CIVision's PLC code running in the vision system. The revision number displayed is displayed to assist in troubleshooting should the need arise.

Close button: C**loses the Digital I/O screen** and return the user to the **Main Administrator** screen.

Admin - System Parameters Screen

The System Parameters screen allows authorized personnel to monitor and maintain system settings. Saved images and log files are viewed through this screen. System wide failure rates and reject settings are also adjusted through the System Parameters screen.


System Parameters
Run Mode Options
Hardware Trigger (Sense Part Automatically / Normal Run Mode)
Save Failure Images to disk - no overlay
Save Failure Images to disk - with color overlay
Save Passed Images to disk - no overlay
Save Passed Images to disk - with color overlay
Debug Options
View Log Files
Open the log file viewer application
View Run Images
Open the run image viewer application
Open NotePad
Open Windows NotePad application to edit text files
Development Mode
Enables features used for software development, these features may not be stable.
Percent Failure Settings
0 Maximum number of failures (0 to disable)
1 Out of this many parts
1 Set size (Set to 1 for normal)
1,2,3,4 Triggers to use this setting (1,2,3,4 to check all triggers)
0 Maximum number of failures (0 to disable)
1 Out of this many parts
1 Set size (Set to 1 for normal)
Triggers to use this setting (1,2,3,4 to check all triggers)
0 Maximum number of failures (0 to disable)
1 Out of this many parts
1 Set size (Set to 1 for normal)
Triggers to use this setting (1,2,3,4 to check all triggers)
Close
Lock
Multi on/off
Multi Select
Graph on/off
Graph Scale
Multi Config
Store Image
Lid Hole/Dent Detect
CIVision
www.civision.com
Currently selected Product
408
Current User: x

Left: The Administrator - System Parameters screen.

This screen is used to monitor and maintain system settings.

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Administrator System Parameters Screen Controls and Functionality:

The Administrator - System Parameters screen offers the following functions and controls:

Run Mode Options

Hardware Trigger mode: Instructs the system to wait for a part to trigger the system before capturing an image. This is the mode that the system runs in during normal inspection runs.

Note: *If Hardware Trigger mode is selected, the test button will not appear in the Run screen.*

Save Fail Images to Disk (no overlay): Instructs the system to save **all** failed views to the hard drive while in Run mode. The images will be saved in the original format **without** the **graphic overlay** displayed in video window. ***Care should be exercised when using this feature -- too many images to the systems hard drive can have serious consequences to the systems performance.***

Note: *This function will slow the system down. Consult with CIVision about the impact this will have on your system.*

Save Fail Images to Disk (Color overlay): When this mode is selected, the system will save failed views as well as the color inspection overlays to the hard drive while in Run mode.

Note: *This function will slow the system down. Consult with CIVision about the impact this will have on your system.*

Save Pass Images to Disk (no overlay): Instruct the system to save **all** passed images to the hard drive while in Run mode. The images will be saved **without** the **graphic overlay** displayed in video window. ***Care should be exercised when using this feature -- too many images to the systems hard drive can have serious consequences to the systems performance.***

Note: *This function will slow the system down. Consult with CIVision about the impact this will have on your system.*

Save Pass Images to Disk (color overlay): Instruct the system to save **all** passed images to the hard drive while in Run mode. The images will be saved **with** the **graphic overlay** displayed in video window. ***Care should be exercised when using this feature -- too many images to the systems hard drive can have serious consequences to the systems performance.***

Note: *This function will slow the system down. Consult with CIVision about the impact this will have on your system.*

Run Mode Options

View Log Files button: Opens a program which will allow the user to view any of the system log files. *For more details about the Log Files, see page 138.*

View Run Images button: Allows the user to view images saved through clicking on Store Image button on the Graphics Tool bar. *For more details about viewing the Run Images, see page 140.*

Open Notepad button: Opens the system's Notepad. The user is then able to edit text files on the system.

Development Mode: When selected, the system enters Developer Mode, which allows the application to be minimized to the task bar.

Percent Failure Error Setting

This section allows the user to limit failure tolerances. If these tolerances are reached, the system displays a fault.

# of Parts to Look Over: In this box, the user sets the sample size used to determine percentage of part failures.

Maximum # of Fails (0 to disable): This box allows the user to set how many rejects are acceptable before the system displays a fault.

Consecutive Reject Error Setting

Maximum Consecutive Rejects (0 to disable): This box allows the user to set how many consecutive rejects should occur on the system before displaying a fault.

Close button: Clicking this button will **close the System Parameters screen** and return the user to the **Main Administrator** screen.

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Admin - View Log Files

All CIVCore powered vision systems now monitor and log every action taken and change made to the system. If a user has the proper permissions, clicking the **View Log Files button** will open the Log File Viewer shown below. These logs record all changes in and user entries onto the system. All log files are compiled and saved by month.

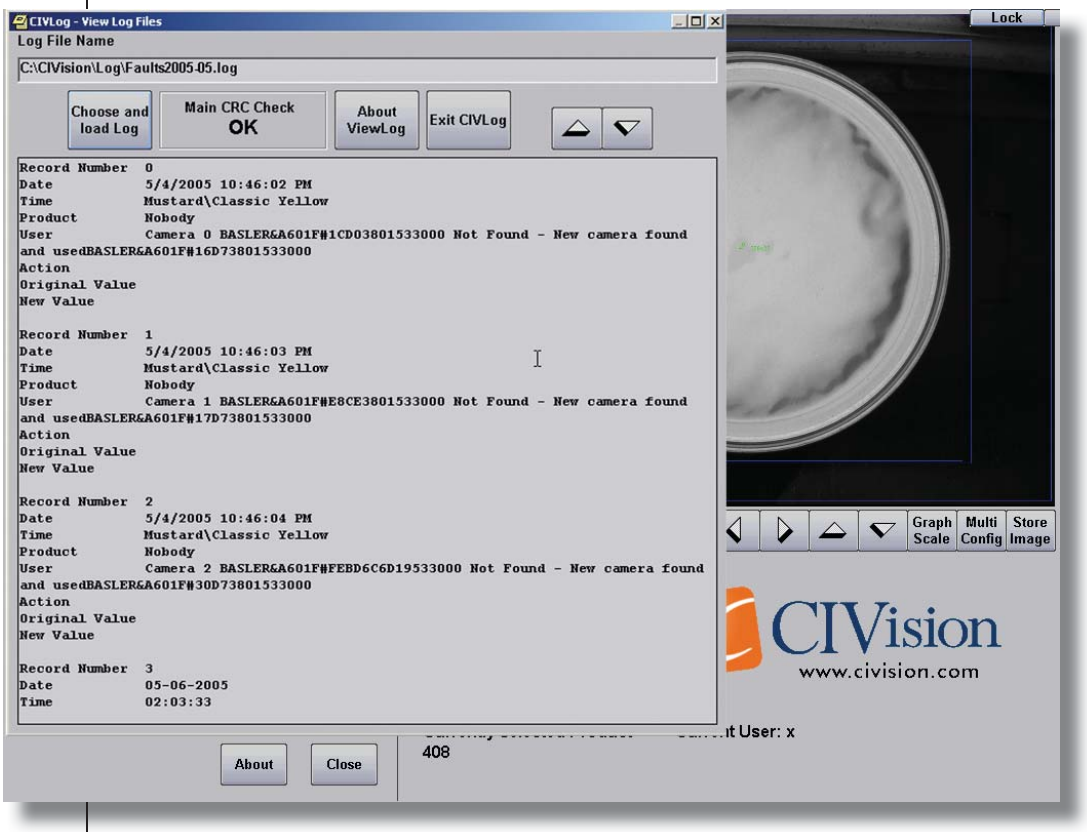
The logs files available to the user are as follows:

Adjustment Log: Tracks ALL adjustments made to system. (More details about this log below).

Error Handler Log: Contain any unusual software errors should they occur.

Faults Log: Tracks all system faults that are displayed in the system faults screen.

User Log: Tracks all logins and logouts into and out of the system.



Left: The Administrator - Log Viewer.

CIVCore logs every change made to the system. This screen allows the administrator to view these log files..

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Administrator Log Viewer Screen Controls and Functionality:

The Administrator -Log Viewer screen offers the following functions and controls:

Log File Name: Displays the path to the log file being viewed.

Read Log button: Used to select a file to view and view it in the large window.

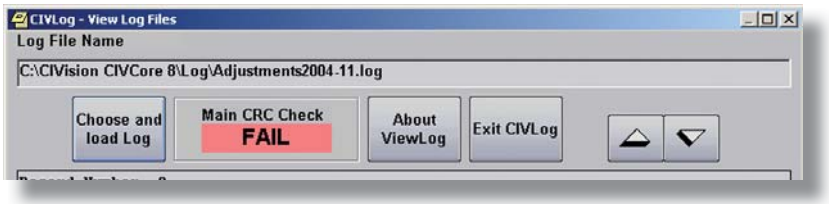
Main CRC Check: Describes the overall condition of the CRC check for the entire log. If something has been tampered with, this dialogue box would display Failed in place of OK.

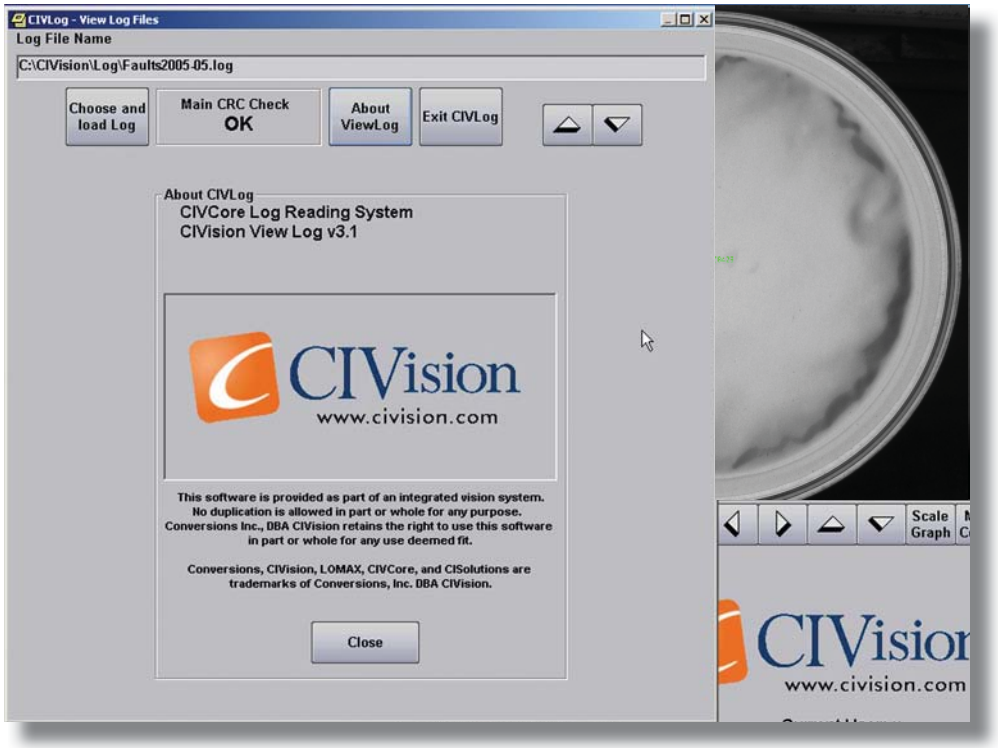
Note: *CRC stands for Cyclical Redundancy Check which checks the integrity of the log file.*

About ViewLog: Displays system information about the view log files See illustration below.

Exit CIVLog: Closes the log viewer and return the user to the **System Parameters** screen.

Right: Main CRC Check with a Fail message. This happens anytime the integrity of the log file being viewed has been broken. Most often, this is the result of someone altering the log.




CIVLog - View Log Files
Log File Name
C:\CIVision\Log\Faults2005-05.log
Choose and load Log
Main CRC Check
OK
About ViewLog
Exit CIVLog
About CIVLog
CIVCore Log Reading System
CIVision View Log v3.1
CIVision
www.civision.com
This software is provided as part of an integrated vision system. No duplication is allowed in part or whole for any purpose. Conversions Inc., DBA CIVision retains the right to use this software in part or whole for any use deemed fit.
Conversions, CIVision, LOMAX, CIVCore, and CISolutions are trademarks of Conversions, Inc. DBA CIVision.
Close
Scale Graph
CIVision
www.civision.com

Left: The ViewLog About screen gives the Version number and copyright information.

How to View Log Files

Finding, Choosing and Viewing System Log Files

To view any of the logs recorded by the vision system, follow the step by step instructions listed below.

Review below steps, the CIVCore User's Manual and the *CIVCore 9 User's Reference Manual* to assist you with running and configuring your CIVision Inspection System.

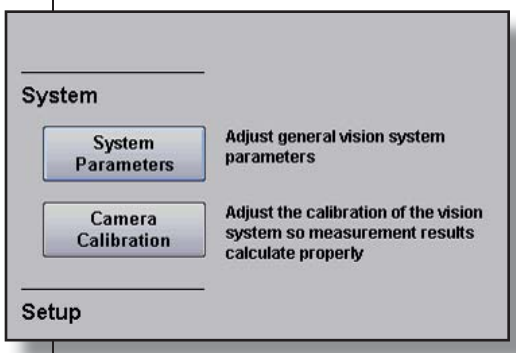
STEP 1 STOPPING THE INSPECTION PROCESS

Locate and Press the Stop Button - first button on *bottom control bar*
To stop the inspection process, press the red Stop button located on the bottom control bar.

The inspection process must be stopped in order to access the Administrator section of the CIVCore software.

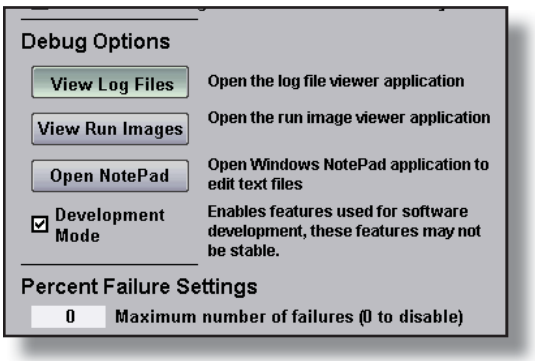
STEP 2 ACCESS THE LOG FILE VIEWER

Locate and Select the Admin Button - *bottom control bar*
To enter the Admin section of the software, locate and press the Admin button (second button from the left) on the bottom control bar. This will open the Administrator Control Window.

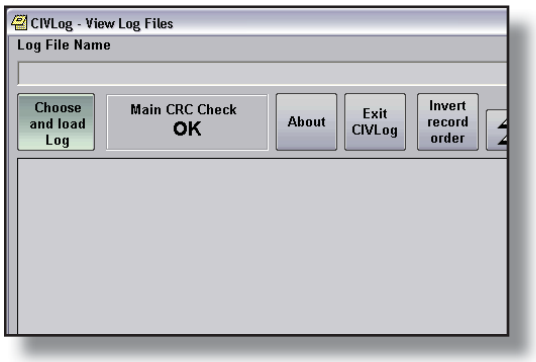


Locate and Select the System Parameters button
Locate and select the System Parameters button located in the left menu bar of the screen. This will open the Administrator Parameter screen where the log viewer can be accessed.

Locate and Select the View Log Files button
Locate and select the View Log Files button located in Debug Options menu. Selecting this button will open the Log File Viewer.


Debug Options
View Log Files
Open the log file viewer application
View Run Images
Open the run image viewer application
Open NotePad
Open Windows NotePad application to edit text files
Development Mode
Enables features used for software development, these features may not be stable.
Percent Failure Settings
0
Maximum number of failures (0 to disable)

STEP 3 SELECT, LOAD, AND VIEW LOG FILES



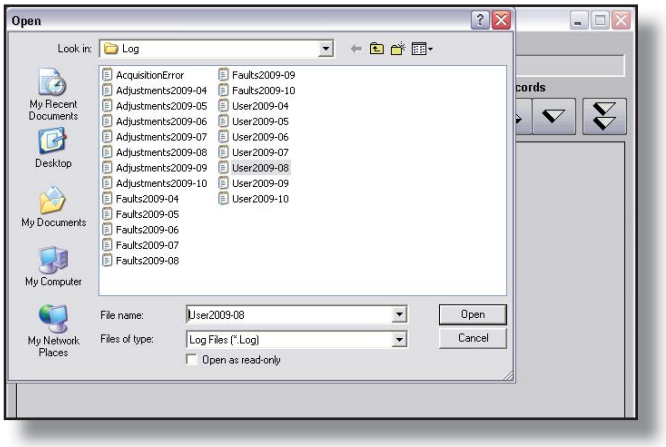
Locate and Select the Choose and Load Log button

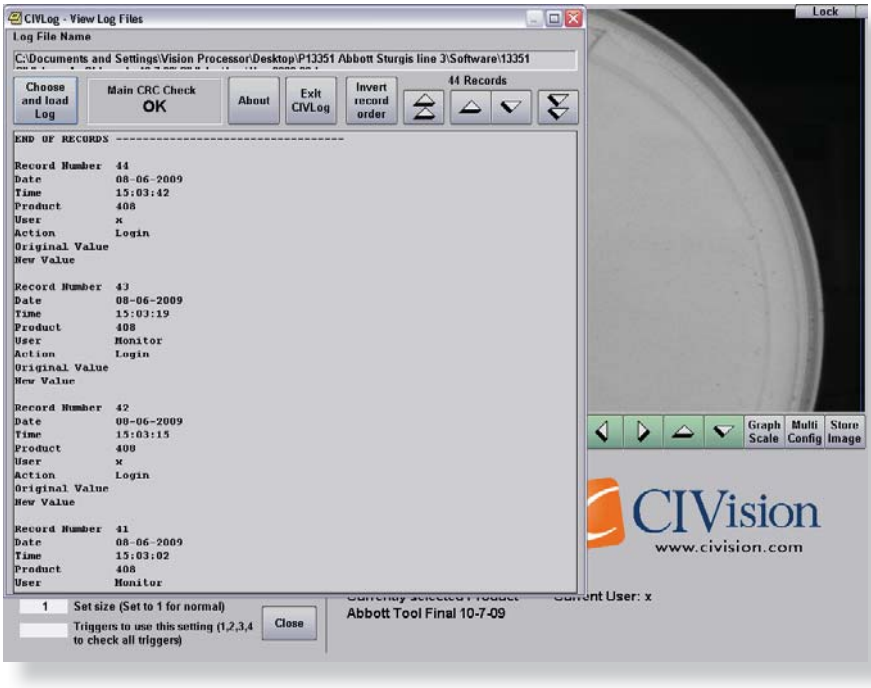
Locate and select the Choose and Load Log button located in the upper left menu bar of the screen. This will take you open an explorer window and allow you to choose and load the log you wish to view.

Select the Log Files You Want to View

Locate and select the Log File you want to see. Select the log from the list of available log files and select the OPEN button.

To cancel opening any log files, select CANCEL.



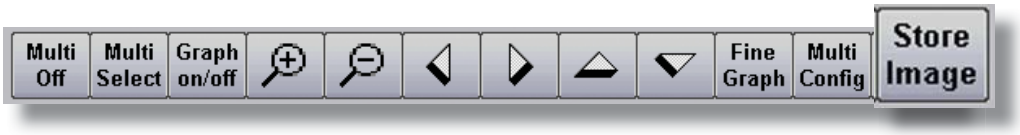


View Your Log File

All of CIVCore's Log Files are stored in CIVCore's Log folder found at C:\CIVCore\Logs.

Admin - View Run Images

All CIVCore powered vision systems provide the user with the opportunity to save any image of interest displayed in the video window by clicking the **Store Image button** on the Window Graphics toolbar *(pictured below)*.



These images are stored on the system's hard drive for later viewing.

The **View Run Images button** allows the user to view these images as well as any other images the system has been instructed to save via the Run Mode section of the System Parameters screen.

Left: The Administrator - View Run Images screen allows the user to view any images that they have saved using the Store Image button or through the System Parameter settings..

Administrator View Run Images Screen Controls and Functionality:

The Administrator -View Run Images screen offers the following functions and controls:

Select Camera: Allows the user to select the camera view they wish to view images from. If the user wants to see **all the saved images**, they simply select the **All Cameras** option.

Pass/Fail Options

Pass box: Used to view all of the saved **Pass** images.

Fail box: Used to view all of the saved **Fail** images.

User box: Used to view all of the images saved by a user using the **Store Image button**.

Note: *A user can select all , one, or two of the categories. At least one of the categories must be selected.*

Display Options

Original box: Used to view the **original** images saved **without** the tools' graphic overlay.

W/ Overlay box: Used to view the saved images **with** the tools' graphic overlay.

Scroll Arrows: Allows the user to scroll through the requested images. Right arrow goes forward through the images, Left arrow goes backwards.

Close button: C**loses the View Run Images screen** and return the user to the **System Parameters** screen.

Image Name: Displays the name of the image being viewed. The naming convention includes, Date, features, Camera Name, Product and User.

How to View Run Images

Finding, Choosing and Viewing Run Images

To view any of the images saved by the vision system, follow the step by step instructions listed below.

Review below steps, the CIVCore User's Manual and the *CIVCore 9 User's Reference Manual* to assist you with running and configuring your CIVision Inspection System.

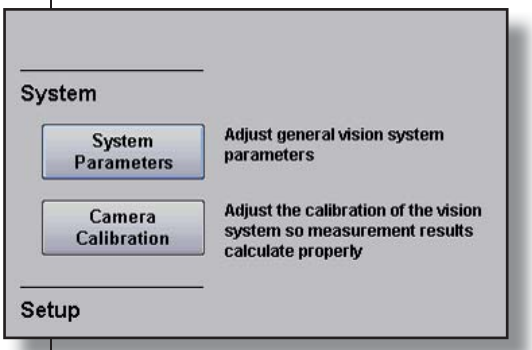
STEP 1 STOPPING THE INSPECTION PROCESS

Locate and Press the Stop Button - first button on *bottom control bar*
To stop the inspection process, press the red Stop button located on the bottom control bar.

The inspection process must be stopped in order to access the Administrator section of the CIVCore software.

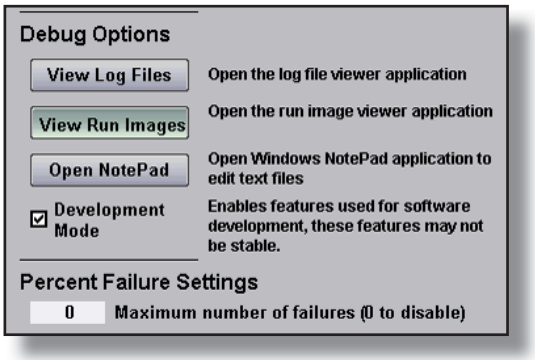
STEP 2 ACCESS THE RUN IMAGES VIEWER

Locate and Select the Admin Button - *bottom control bar*
To enter the Admin section of the software, locate and press the Admin button (second button from the left) on the bottom control bar. This will open the main Administrator Parameter window.



Locate and Select the System Parameters button
Locate and select the System Parameters button located in the left menu bar of the screen. This will open the Admin System Parameter screen where the log viewer can be accessed.

Locate and Select the View Run Images button
Locate and select the View Log Files button located in Debug Options menu. Selecting this button will open the Run Images Viewer.


Debug Options
View Log Files
Open the log file viewer application
View Run Images
Open the run image viewer application
Open NotePad
Open Windows NotePad application to edit text files
Development Mode
Enables features used for software development, these features may not be stable.
Percent Failure Settings
0
Maximum number of failures (0 to disable)

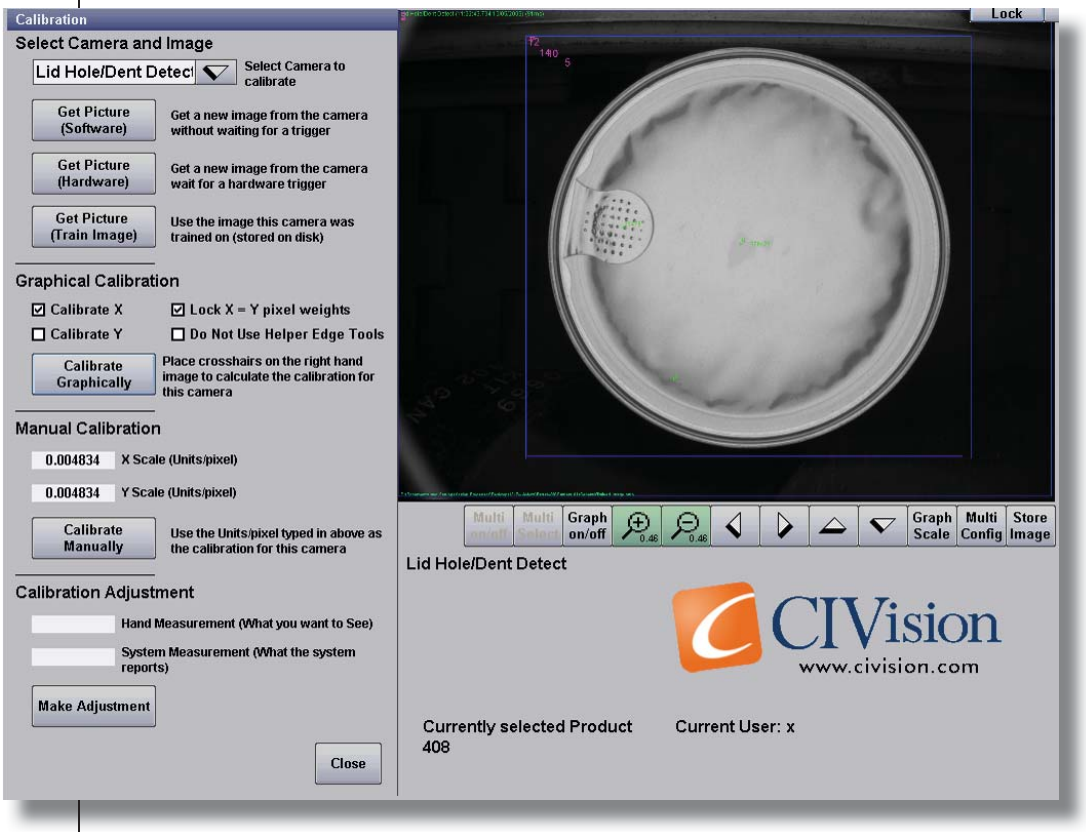
STEP 3 VIEW RUN IMAGES

Use Left and Right Arrows to Scroll Through Saved Images
To learn more about other controls associated with Image viewer, see previous section.

Saved images can be found in the CIVCore images folder found at C:\CIVCore\Images.

Admin - Camera Calibration Screen

When the user clicks on the **Camera Calibration** button, the Calibration screen is displayed as shown below. The Calibration screen allows the user to calibrate individual camera views from "Pixel" coordinates to "Real World" coordinates.



Left: The Administrator - Calibration screen allows the user to calibrate (fine tune) the selected camera.

Administrator Calibration Screen Controls and Functionality:

The Administrator Calibration screen offers the following functions and controls:

Select Camera and Image

Camera selection and picture acquisition mode are adjusted in this section.

Select Camera: Allows the user to select the camera view they wish to calibrate.

Get Picture (software): When selected, the image screen will always be updated by the next image in front of the selected camera.

Get Picture (hardware): When selected, the user must trigger the system by passing product through the line. The image captured by the camera at the time of the trigger will be used.

Get Picture (Train Image): When selected, the user must trigger the system by passing product through the line. The image captured by the camera at the time of the trigger will be used.

Graphical Calibration Section

Calibrate X: Allows users to automatically calibrate pixels in the "X" direction.

Calibrate Y: Allows users to automatically calibrate pixels in the "Y" direction.

Lock X-Y Pixel Weights: If the camera has square pixels, this option allows the user to calibrate both "X" and "Y" Pixel weights at the same time.

Do Not Use Helper Edge Tool: Turns off the helper edge tool provided to simplify camera calibration. The edge tools find the strongest edge above the crosshair. That edge is used to calculate the camera calibration.

Note: *This option would be used, for example, when trying to calibrate a part containing complex edges.*

Calibrate Graphically: Allows the user to calibrate a part using crosshair tools and system prompts.

Depending on which boxes above are checked, ("X", "Y" or "X" and "Y"), the system will ask for appropriate measurements (These measurements are to be taken by hand before sending part through the system). The "X" measurement is used as an example below.

The system will prompt user to send part through the system to capture an image. This image will be use to calibrate the camera. The system will then prompt the user to place the crosshair tool at 1st measurement point and then the second point - (If "X" and "Y" calibration were being down the system would repeat the same process for "Y").

The system then updates the pixel weights in the "X" and "Y" text boxes above with the new numbers and then asks is if these new weights should be used. If user says yes, the cameras are updated with the new calculated numbers.

Manual Calibration Section

X Scale (Units/pixel): Displays the pixel weight that the system is currently using to calculate the "X" direction (width).

Y Scale (Units/pixel): Displays the pixel weight that the system is currently using to calculate the "Y" direction (height).

Change Manually button: Allows the user to manually change the pixel weight that is entered in the X & Y scale data entry boxes.

Calibration Adjustment Section

Hand Measurements: The user is to enter the hand measurement of the part in this box. The measurement can be either the "X" (width) or the "Y" (height) of the part.

System Measurements: The user will enter what the system reported from an inspection in this box. .

Note: *The user is required to run the same bottle used in the hand calibration through the system to acquire this measurement.*

Make Adjustment button: When selected, the system will calculate and set what the calibration should be.should be.

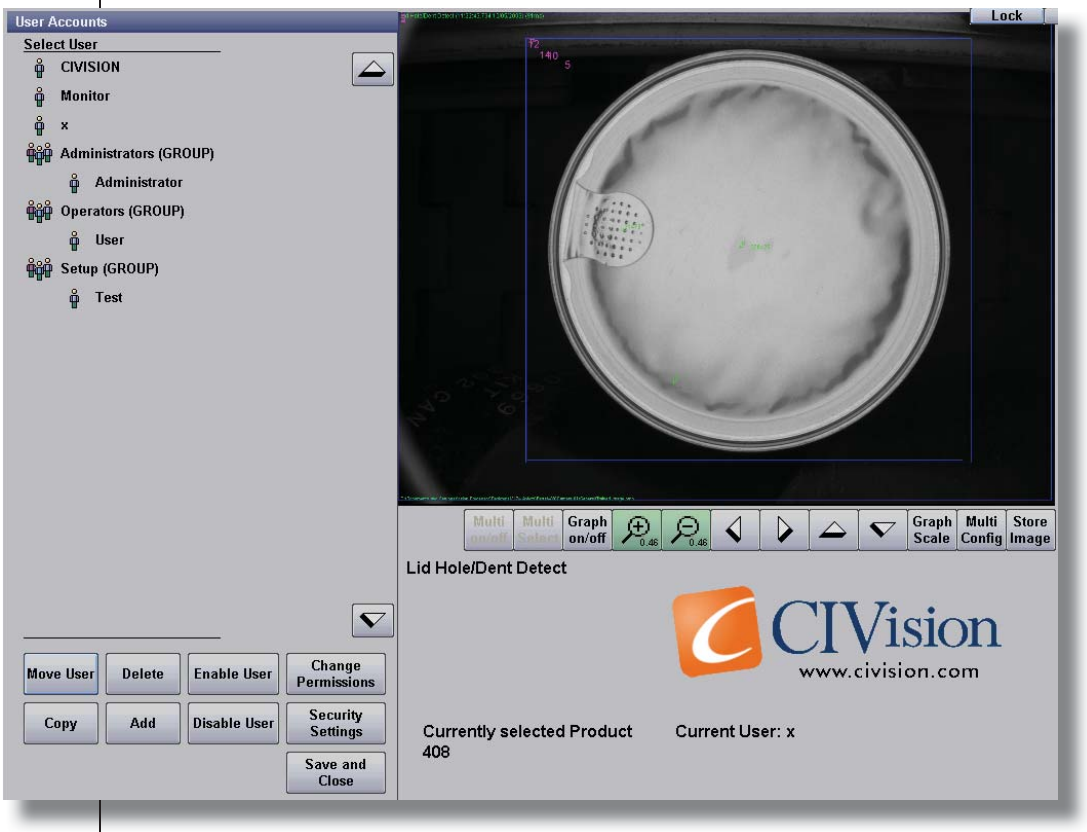
Close button: This button will **Apply** the changes made, close the **Calibration screen** and return the user to the **System Parameters** screen.

CIVCore 9

Admin - User Accounts

The Administrator User Account screen allows the system administrator to edit the user accounts of all single user and user groups programmed into the system. Some of the tools and controls on this screen include adding/removing users, enabling/disabling users, and changing users passwords and permissions levels.

Tree menu navigation has been used to simplify the creation and organization of users and user groups. System administrators can now drag and drop users and user groups into and out of groups or subgroups into other groups or subgroups.



Left: The Administrator - User Accounts screen allows the system administrator to add, delete and edit the user and user group accounts of all users programmed into the system.

Administrator - User Accounts Screen Controls and Functionality:

The Administrator - User Accounts screen offers the following functions and controls:

Select User: All users are programmed into the system are displayed here. To select a user or user group, single click on the name to highlight it and then choose any of the below functions. If the list of users is longer then the Select User window, the user can scroll through the list using the up/down scroll buttons provided on the right side of the window.

Move User: Allows the administrator to move the selected user or user group. After clicking the Move User button, the user would click, hold and drag the user or group they wish to move to the appropriate location in the tree menu.

Copy User: Allows the administrator to copy the highlighted user's profile. The copied profile can then be renamed and set up as any user.

Delete: Allows the administrator to remove the highlighted user from the user list. The user would have to be reprogrammed into the system.

Add: Allows the administrator to add a new registered user to the inspection system. All permissions and security settings would have to be done from scratch.

Enable User: Allows the administrator to enable the highlighted user or user group. This feature allows the administrator the ability to reinstate a suspended user's access to the system.

Disable User: Disables the highlighted user's access to the system. This feature allows the administrator the ability to suspend a user's access to a machine without removing them from the system.

Change Permissions: Allows the administrator to change the highlighted user's **Permissions** levels. *Read more about this process on page ###.*

Security Settings: Allows the administrator to open the **Security Settings** screen. The security settings screen set up the parameters for the highlighted user or user groups's password and login and automatic logout. *Read more about this screen on page ###.*

Save and Close: Save all changes made in the current session and return the user to the **Main Administrative Functions** screen.

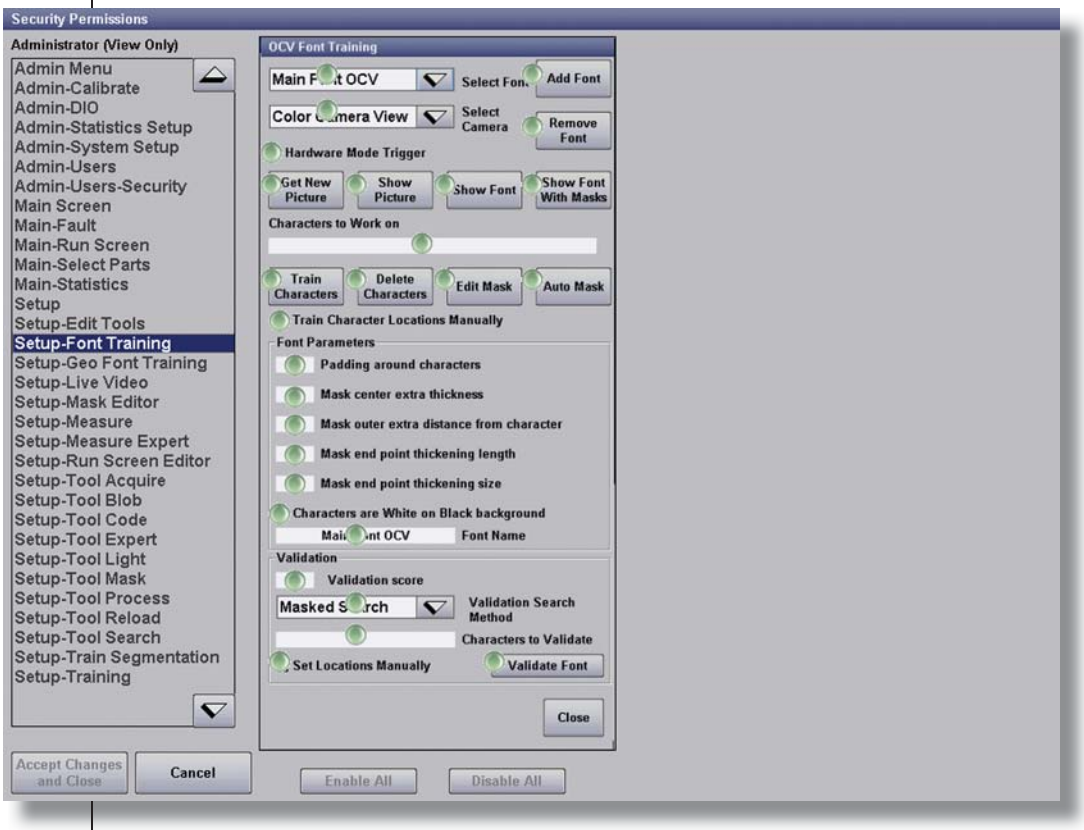
Admin - Security Permissions Screens

All CIVCore - powered inspection systems provide for multiple user permissions levels. Administrators can enable and disable different permissions that allow access to different parts of the system.

The system will Log all items selected in the software to a file for future reference. If a user selects an option that they are permitted to use, the system will Log which button was pressed, which user pressed the button and the date and time.

To Log In as a new user, the Operator clicks on the User Login button and enters the correct User Name and Pass Word (if applicable). If the correct User Name and Pass Word are entered correctly, the new User Name is enabled, and the operator has access to the permissions that the Administrator has granted.

The Administrator selects which permissions each user has access to. The Security Permission Menu, located in the Administrator - User Accounts Screen, allows the system Administrator to modify any user's permissions.



Left: The User Permissions screen for the OCV Font Training screen. Green lights signify that the feature has been activated for the user or user group being edited.

Using the **List Window** on the left of the Permissions Screen, the administrator chooses which system window he/she wants to set permissions in by double clicking its name. Upon clicking, the system will display all functions and action of the selected screen.

By each function that can be operated, there is an indicator button. Green light means access given, Red light means access denied.

The Administrator simple works his way down the List window granting or denying access for the user being edited.

Note: *If a button is greyed out, the Administrator DOES NOT have permission themselves to change the greyed-out item.*

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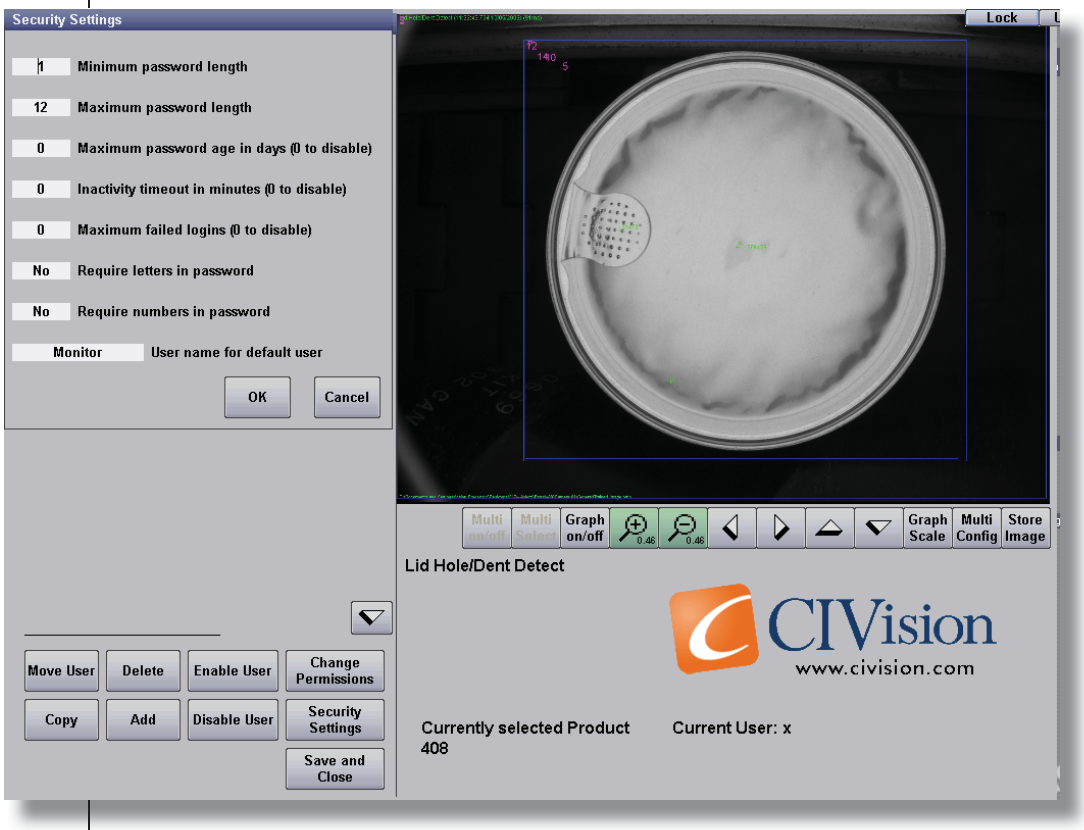
Admin - Security Settings

With the proper permissions, a user can access the Security Settings shown below. This screen allows the system administrator to set user password and login parameters.



Left: The Administrator - Security Settings screen.

This screen is where the administrator sets system password and login parameters for system users.

Administrator Security Settings Screen Controls and Functionality:

The Administrator Security Settings screen offers the following functions and controls:

Minimum Password Length: Using this cell, the system administrator can set the minimum length a user password can be.

Maximum Password Length: Using this cell, the system administrator can set the maximum length a user's password can be.

Max. Password Age in Days: The number of days a user's password will be valid before they are required to change it. *A 0 (zero) entered into this box will disable the feature.*

Inactivity Timeout in Minutes: The length of time a user can stay logged into the system without hitting any buttons before the system will automatically log them out. *A 0 (zero) entered into this box will disable the feature.*

Maximum Failed Logins: Sets the maximum number of times a in a row a bad password can be attempted before the account is disabled. ***A 0 (zero) entered into this box will disable the feature.***

Require Letters in Password: Allows the administrator to require a user to use letters in their login passwords. As for system security, a random alpha - numeric *(a mix of letters and numbers)* password is considerably harder to guess.

Yes: States the user must use letters in their system passwords.

No: States the user doesn't need to have letters in their system password.

Require Numbers in Password: Allows the administrator to require a user to use numbers in their login passwords. As for system security, a random alpha - numeric *(a mix of letters and numbers)* password is considerably harder to guess.

Yes: States the user must use numbers in their system passwords.

No: States the user doesn't need to have numbers in their system password.

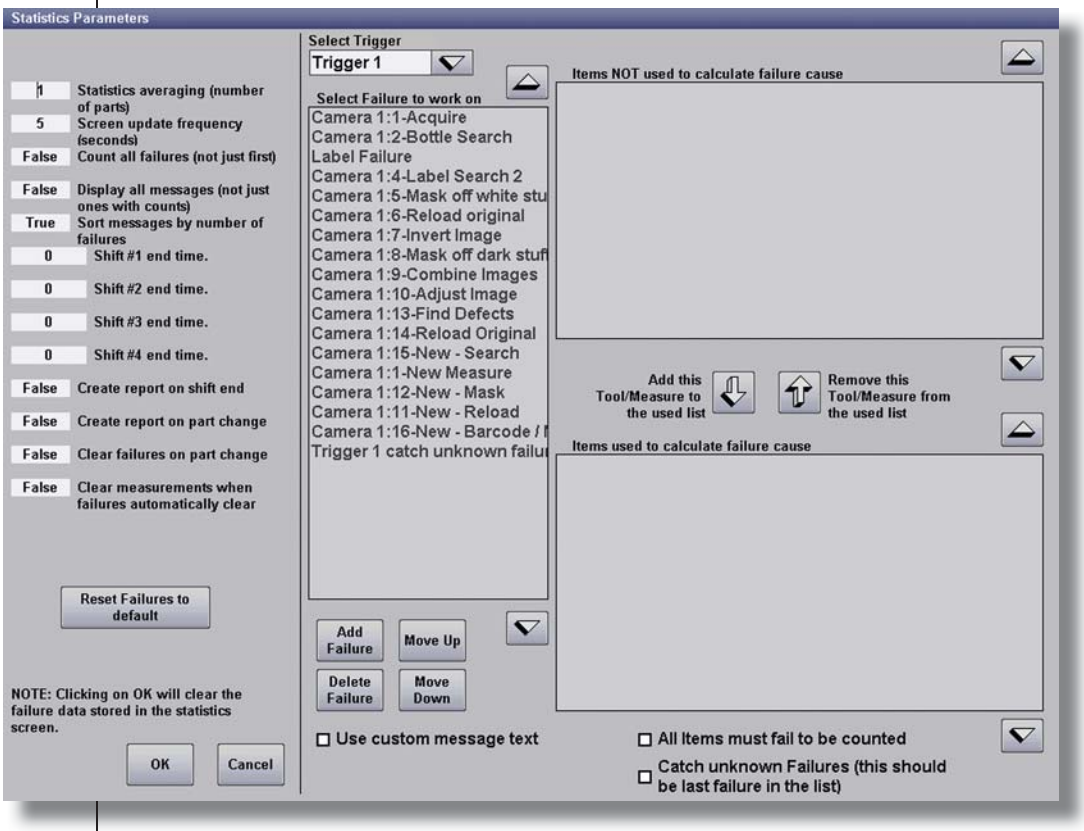
User Name for Default User: This feature allows the administrator to enter a name for the default user.

Okay button: Saves changes made, close the **Security Settings** screen and return to the **Administrative Functions** screen.

Cancel button: Click to cancel changes made during the session, close the **Security Settings** screen and return to the **Administrative Functions** screen.

Admin - Statistics Parameters

One of the newest features to the system's administrative control suite is added flexibility in manipulating the statistical package. This allows more freedom for the system administrator to capture statistics and monitor trends specific to the inspection jobs at hand.


Statistics Parameters
1 Statistics averaging (number of parts)
5 Screen update frequency (seconds)
False Count all failures (not just first)
False Display all messages (not just ones with counts)
True Sort messages by number of failures
0 Shift #1 end time.
0 Shift #2 end time.
0 Shift #3 end time.
0 Shift #4 end time.
False Create report on shift end
False Create report on part change
False Clear failures on part change
False Clear measurements when failures automatically clear
Reset Failures to default
NOTE: Clicking on OK will clear the failure data stored in the statistics screen.
OK
Cancel
Select Trigger
Trigger 1
Select Failure to work on
Camera 1:1-Acquire
Camera 1:2-Bottle Search
Label Failure
Camera 1:4-Label Search 2
Camera 1:5-Mask off white stu
Camera 1:6-Reload original
Camera 1:7-Invert Image
Camera 1:8-Mask off dark stuf
Camera 1:9-Combine Images
Camera 1:10-Adjust Image
Camera 1:13-Find Defects
Camera 1:14-Reload Original
Camera 1:15-New - Search
Camera 1:1-New Measure
Camera 1:12-New - Mask
Camera 1:11-New - Reload
Camera 1:16-New - Barcode /
Trigger 1 catch unknown failu
Add Failure
Move Up
Delete Failure
Move Down
Use custom message text
Items NOT used to calculate failure cause
Add this Tool/Measure to the used list
Remove this Tool/Measure from the used list
Items used to calculate failure cause
All Items must fail to be counted
Catch unknown Failures (this should be last failure in the list)

Left: The Administrator - Statistics Parameters screen.

This screen is were the administrator sets system password and login parameters for system users.

Administrator Statistics Parameters Screen Controls and Functionality:

The Administrator Statistics Parameters screen offers the following functions and controls:

Statistics Averaging (Number of Parts): Allows the user to set the number of parts displayed in the strip chart displayed in the **Statistics screens**.

Screen Update Frequency: Allows the user to set the update rate of the statistical information displayed on the **Statistics screens**. This number represents seconds.

Count All Failures (not just first): An inspected item may fail for more then one reason and more then one camera may fail a bad part. This feature allows the user to choose whether to stop tracking failures on a part after the first failure or track all of them.

- ***Yes:*** States the user wants the system to display all failures from all cameras on the Statistic pages.
- ***No:*** States the user wants to count the first failure.

Display All Messages: Complete this box with Yes or No

Yes: States the user wants the system to display all possible messages generated during the inspection cycle - even if the count is 0 (zero).

No: States the user doesn't want all messages displayed.

Sort Messages by # of Failures: Complete this box with Yes or No

Yes: States the user wants the failure which occurs most often to appear at the top of the list.

No: States the user will let the system determine how the failure messages are displayed.

Shift #1 End Time: Allows the user to enter the time that the first shift ends. This is only needed if the administrator wants to create a report or clear all failed units stats at end of shift *(These options are described in more detail below).*

Shift #2 End Time: Allows the user to enter the time the second shift ends. *(Can be left blank).*

Shift #3 End Time: Allows the user to enter the time the third shift ends. *(Can be left blank).*

Shift #4 End Time: Allows the user to enter the time the fourth shift ends. *(Can be left blank).*

Create Report on Shift End: Complete this box with Yes or No

Yes: States the user wants the system to automatically create a report of all failures, passes and errors at the end of each shift.

No: States the user doesn't want the system to create a report at the end of each shift.

Create Report on Part Change: Complete this box with Yes or No

Yes: States the user wants the system to automatically create a report upon the user changing the system to inspect a new part.

No: States the user doesn't want the system to create a report upon changing parts.

Clear Failures on Part Change: Complete this box with Yes or No

Yes: States the user wants the system to automatically clear failures upon changing parts.

No: States the user doesn't want the system to automatically clear failures upon changing parts.

Clear Measures when Failures Clear: Complete this box with Yes or No

Yes: States the user wants the system to clear the measurements displayed when it purges the Failures when doing an Automatic Clear.

No: States the user doesn't want the system to clear the measurement column.

Reset Failures to Default: This feature has been added for users of previous CIVCore releases. This button allows the user to make the failure messages work like they always have in CIVCore - **one message for each tool and measure in the system**. *This button can also used to reset the statistics after adding or deleting tools from the system.*

The right hand side of the screen contains an all new system of reporting on product failures through the **Statistics** screens' Pareto chart.

Select Trigger: The Pareto chart data is all collected individually for each trigger, this selection allows you to choose which trigger you wish to currently setup.

Select Failure to Work on: This window contains all the messages which can show up on the **Statistic screens'** Pareto chart. Selecting one (clicking and highlighting) allows the user to edit which tools or failures will cause this message to occur. It also allows the user to change the message text and other settings associated with the selected message.

Add Failure: Allows the user to add a new blank failure to the end of the failure list. The message text will change to the name of the first tool or measurement added to its used list,

unless you have checked the "Use custom message text" checkbox. After adding a failure you have to add tools or measurements to it or check the "catch unknown failures" checkbox for the new failure to do anything.

Delete Failure: Allows the user to remove the currently selected failure from the list of possible Pareto chart failures.

Move Up and Move Down: Allow the user to move the selected failure up or down in the Select Failure to Work On window.

The user may want to change the order of the list *(the system will normally be configured to only display the first message which fails and then stop searching).* The list is searched for failures from the top down.

Items Not Used ... Window: This list contains all the tools and measurements on the selected trigger which currently **will not contribute** to the selected Failure.

When the user selects one of the items in this window and clicks on the down arrow below this window, the item will be moved to the window below. The freshly moved item will then contribute to the selected Failure.

Items Used to ... Window:

This list contains all the tools and measurements on the selected trigger which **will contribute** to the selected failure

When the user does not want an item in this list, they must select it and click on the up arrow above this list. The freshly moved item will not contribute to the selected Failure.

All Items Must Be Counted:

When this box is checked, all of the items in the **Items Used** list must all fail on the same part for the selected Failure message to go into the Pareto chart. When this box is unchecked any of the items in the **Items Used** list can fail and the selected Failure message will go into the Pareto chart.

The checked **All Items Must Be Counted box** implements an **and** function on the list.

The unchecked **All Items Must Be Counted box** implements an **or** function on the list.

Catch Unknown Failures:

When this box is checked, it makes the selected Failure a default failure that will happen if no other failures have occurred before it in the list and the current inspection has failed. This allows you to have a **catch all failure** so your Pareto chart will have at least 1 message for each failed product. This means that the **Items used to calculate failure cause list** is not required for this Failure because the items in that list will be ignored.

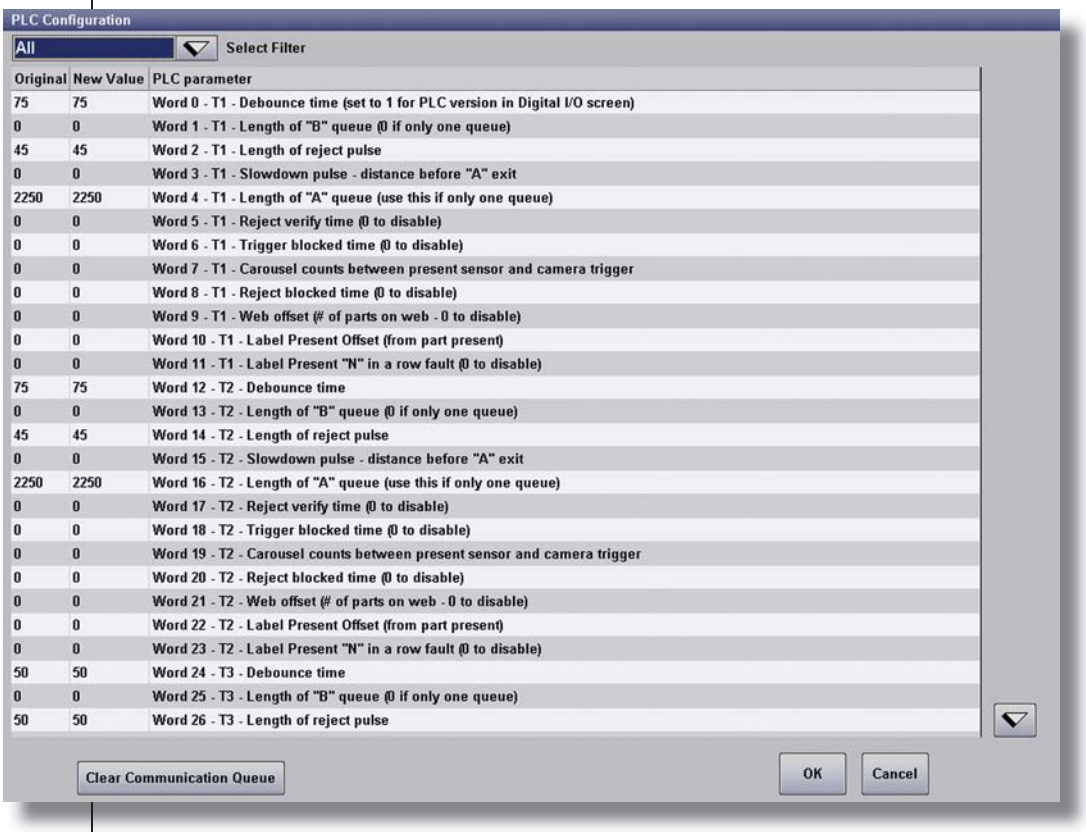
CIVision recommends always having one of these Failures at the end of the list.

After clicking **Reset Failures to Default**, the system will add one of these to the end of the list, but in production that failure will never count as a failure because the list above it will catch any product failures.

When this box is unchecked then the **Items used to calculate failure cause** list works normally.

Admin - PLC Configuration Screen

The PLC configuration screen is used to configure certain hardware aspects of the inspection system. It should only be used by those who REALLY know the system. Therefore, this is only a brief insight into the configuration screen.


PLC Configuration
All
Select Filter
Original
New Value
PLC parameter
75 75 Word 0 - T1 - Debounce time (set to 1 for PLC version in Digital I/O screen)
0 0 Word 1 - T1 - Length of "B" queue (0 if only one queue)
45 45 Word 2 - T1 - Length of reject pulse
0 0 Word 3 - T1 - Slowdown pulse - distance before "A" exit
2250 2250 Word 4 - T1 - Length of "A" queue (use this if only one queue)
0 0 Word 5 - T1 - Reject verify time (0 to disable)
0 0 Word 6 - T1 - Trigger blocked time (0 to disable)
0 0 Word 7 - T1 - Carousel counts between present sensor and camera trigger
0 0 Word 8 - T1 - Reject blocked time (0 to disable)
0 0 Word 9 - T1 - Web offset (# of parts on web - 0 to disable)
0 0 Word 10 - T1 - Label Present Offset (from part present)
0 0 Word 11 - T1 - Label Present "N" in a row fault (0 to disable)
75 75 Word 12 - T2 - Debounce time
0 0 Word 13 - T2 - Length of "B" queue (0 if only one queue)
45 45 Word 14 - T2 - Length of reject pulse
0 0 Word 15 - T2 - Slowdown pulse - distance before "A" exit
2250 2250 Word 16 - T2 - Length of "A" queue (use this if only one queue)
0 0 Word 17 - T2 - Reject verify time (0 to disable)
0 0 Word 18 - T2 - Trigger blocked time (0 to disable)
0 0 Word 19 - T2 - Carousel counts between present sensor and camera trigger
0 0 Word 20 - T2 - Reject blocked time (0 to disable)
0 0 Word 21 - T2 - Web offset (# of parts on web - 0 to disable)
0 0 Word 22 - T2 - Label Present Offset (from part present)
0 0 Word 23 - T2 - Label Present "N" in a row fault (0 to disable)
50 50 Word 24 - T3 - Debounce time
0 0 Word 25 - T3 - Length of "B" queue (0 if only one queue)
50 50 Word 26 - T3 - Length of reject pulse
Clear Communication Queue
OK
Cancel

Left: The Administrator - PLC Configuration screen.

This screen is used to make changes to the systems PLC. Care should be had when changing settings -- things can go very wrong if settings aren't correct.

Administrator PLC Configuration Screen Controls and Functionality:

The Administrator PLC Configuration screen offers the following functions and controls:

Note: *The main purpose of this screen is to aid in the debugging of the machine should the need arise. Changing PLC data in random locations may cause the system to malfunction and pass bad parts.*

Select Filter Using this pulldown menu, the user chooses which PLC control area they wish to edit.

Clear Communication Queue: Resets the communication link between the PC and PLC.This can cause data to be lost and is only recommended for use when troubleshooting PLC to PC communication issues.

Okay button: Closes the PLC Configuration Screen and return to the **Administrative Functions** screen.

Cancel button: Cancels any active function and return the user to the **Administrative Functions** screen.

Admin - About Window

When clicked, the About button opens the About window shown below. The information displayed in this window provides system information that may provide useful for trouble shooting or (when the time comes) deciding what software upgrades are needed to keep your system running at top capacity.

The About screen also contains copyright and other legal information pertaining to the inspection system.

About
CIVCore Inspection System
- P12998 Abbott Release 1.1.0 (CIVCore 9.31.00)
Measurement component
- CIVCore 90001 Measurements v2.11
Acquisition component
- Camera acquisition for GigE & IEEE-1394 cameras (MIL 8.0 with M800DU14c & M800DU11) Version 2.2.0 Build 94 0FPS Tue Feb 3 15:30:27 2009
MIL vision processing components
- Version 8
Authorization Key 11-10262514 Update 1
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Portions of this software copyrighted by other entities:
MIL - Copyright Matrox Electronic Systems Ltd.
Grid Control - VSFlexGrid 7.0 - Copyright VideoSoft
Subclassing Control - Copyright Desaware
Winhook Control - Copyright Desaware
This software uses the FreeImage open source image library. See http://freeimage.sourceforge.net for details.
FreeImage is used under the FIPL, version 1.0
Close
Lock
Multi
Store
Image

Right: The Administrator - About screen.

This screen contains all version and copyright information. If there is ever a need for troubleshooting the software, this is the first place a CIVision engineer will ask the caller to go.

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